Atlanta, GA—Fulton County Airport-Brown Field, ILS RWY 8, Amdt. 13
Lihue, HI—Lihue, VOR/DME or TACAN RWY 21, Amdt. 2
Portland, OR—Portland Intl, VOR-A Amdt. 8
Portland, OR—Portland Intl, VOR-B, Orig.
Portland, OR—Portland Intl, VOR RWY, 28R Orig.
Portland, OR—Portland Intl, LOC BC RWY 10L, Amdt. 12
Portland, OR—Portland Intl, NDB RWY 28R, Amdt. 9
Portland, OR—Portland Intl, ILS RWY 10R, Amdt. 28
Portland, OR—Portland Intl, ILS RWY 28R, Amdt. 11
Vancouver, WA—Pearson Airpark, LDA BC RWY 8, Amdt. 3

** * * Effective March 29, 1988*

Worcester, MA—Worcester Muni, NDB RWY 11, Amdt. 17
Worcester, MA—Worcester Muni, NDB RWY 29, Amdt. 9
Worcester, MA—Worcester Muni, ILS RWY 11, Amdt. 18

** * * Effective March 25, 1988*

Boston, MA—General Edward Lawrence Logan Intl, VOR/DME RWY 33L, Orig.

[FR Doc. 88-8210 Filed 4-13-88; 8:45 am]

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FEDERAL TRADE COMMISSION

16 CFR Part 13

[Dkt. 9159]

The B.F. Goodrich Company et al.; Prohibited Trade Practices and Affirmative Corrective Actions

AGENCY: Federal Trade Commission.

ACTION: Final order.

SUMMARY: This Final Order requires Goodrich, a corporation with its principal place of business in Akron, Ohio, to divest the vinyl cloride monomer (VCM) plant, in La Porte, Texas, at no mimimum price, to a Commission-approved acquirer and must also provide all supporting material to the acquirer. Diamond Shamrock Chemicals Company is prohibited from interfering with the divestiture and, for five years, must continue to supply all utilities, services, and supplies to the acquirer. In addition, Goodrich must, for 10 years, receive FTC approval before acquiring any interest in any producer of VCM located in the United States. The Commission also dismissed part of the complaint concerning the polyvinyl chloride (PVC) market.

DATES: Complaint issued January 4, 1982. Final Order issued March 15, 1988.[1]

FOR FURTHER INFORMATION CONTACT: Rhett Krulla, FTC/S-3302, Washington, DC 20580. (202) 326-2608.

SUPPLEMENTARY INFORMATION: In the Matter of the B.F. Goodrich Company, a corporation, Diamond Shamrock Chemicals Company, a corporation, and Diamond Shamrock Plastics Corporation, a corporation. The prohibited trade practices and/or corrective actions, as codified under 16 CFR Part 13, are as follows: Subpart—Acquiring Corporate Stock Or Assets: Section 13.5 Acquiring corporate stock or assets; S.13.5-20 Federal Trade Commission Act. Subpart—Corrective Actions And/Or Requirements: S.13.533 Corrective actions and/or requirements; S.13.533-45 Maintain records; S.13.533-45(k) Records, in general; S.13.533-50 Maintain means of communication.

List of Subjects in 16 CFR Part 13

Plastics, Trade practices.

(Sec. 6, 38 Stat. 721; 15 U.S.C. 46. Interpret or apply sec. 5, 38 Stat. 719, as amended; sec. 7, 38 Stat. 731, as amended; 15 U.S.C. 45, 18)

Before Federal Trade Commission

[Docket No. 9159]

Final Order

Commissioners: Daniel Oliver, Chairman, Patricia P. Bailey, Terry Calvani, Mary L. Azcuenaga, Andrew J. Strenio, Jr.

In the matter of The B.F. Goodrich Company a corporation, Diamond Shamrock Chemicals Company, a corporation, and Diamond Shamrock Plastics Corporation, a corporation.

This matter has been heard by the Commission upon the appeal of complaint counsel from the initial decision and upon briefs and oral argument in support of and in opposition to the appeal. For the reasons stated in the accompanying opinion, the Commission has determined to deny the appeal in part and to grant the appeal in part. Accordingly,

It is ordered, that the findings of fact and initial decision of the Administrative Law Judge be adopted insofar as not inconsistent with the findings of fact and conclusions contained in the accompanying opinion.

It is further ordered, that the following order be and the same hereby is entered:

[1] Copies of the Complaint, Initial Decision, Opinions etc. are available from the Commission's Public Reference Branch, H-130, 6th St.& Pa. Ave., NW., Washington, DC 20580. (202) 326-2222.

I

Definitions

It is ordered that for purposes of this Order the following definitions shall apply:

A. "Goodrich" means The B.F. Goodrich Company, a corporation organized under the laws of New York with its principal place of business in Akron, Ohio, and its directors, officers, agents, and employees, and its subsidiaries, divisions, affiliates, successors, and assigns.

B. "Diamond Shamrock" means Diamond Shamrock Chemicals Company, a corporation organized under the laws of Delaware with its principal place of business in Dallas, Texas, and its directors, officers, agents, employees, subsidiaries, divisions, affiliates, successors, and assigns.

C. "La Porte VCM Plant" means the VCM manufacturing facility located at La Porte, Texas, and all assets, titles, properties, interests, rights and privileges, tangible and intangible, related to the VCM business, that were acquired by Goodrich from Diamond Shamrock pursuant to the January 4, 1982, agreement between Goodrich and Diamond Shamrock, together with all improvements thereto.

D. "VCM" means vinyl chloride monomer, a gaseous, reactive, acyclic intermediate chemical, with chemical identity $CH_2=CHCl$, also called chloroethylene or monochloroethylene.

II

It is ordered that within twelve (12) months from the date this Order becomes final, Goodrich shall divest, absolutely and in good faith, at no minimum price, the La Porte VCM Plant. The purpose of the divestiture is to establish the La Porte VCM Plant as a viable competitor in VCM, by insuring its continuation as an ongoing, viable enterprise in the VCM industry; and to remedy the lessening of competition resulting from the acquisition of the La Porte VCM Plant by Goodrich. The divestiture shall be made only to an acquirer or acquirers, and only in a manner, that receives the prior approval of the Federal Trade Commission.

Pending divestiture, Goodrich shall take all measures necessary to maintain the La Porte VCM Plant in its present condition and to prevent any deterioration, except for normal wear and tear, of any part of the La Porte VCM Plant, so as not to impair the La Porte VCM Plant's present operating viability or market value.

III

It is further ordered that at the time of the divestiture required by this Order, Goodrich shall provide to the acquirer of the La Porte VCM Plant, on a nonexclusive basis, all VCM technology (including patent licenses and know-how) used by Goodrich, or developed by Goodrich, for use in the La Porte VCM Plant; and

For a period of one (1) year following the divestiture required by this Order, Goodrich shall provide the acquirer of the La Porte VCM Plant, if the acquirer so requests, such additional know-how as may reasonally be required to enable such acquirer to manufacture and sell VCM. Goodrich shall charge the acquirer no more than its own costs for providing such additional know-how.

IV

It is further ordered that at the time of the divestiture required by this Order, Goodrich shall assign to the acquirer of the La Porte VCM Plant all chlorine and ethylene feedstock supply agreements; all VCM supply, sales, toll, or exchange agreements; and all VCM customer records and files relating to VCM produced in (or supplied by Goodrich at any time since January 1, 1985 from) the La Porte VCM Plant.

V

It is further ordered that if Goodrich has not divested the La Porte VCM Plant within the twelve-month period provided in Paragraph II of this Order, the Federal Trade Commission may appoint a trustee to effect the divestiture. The trustee shall be a person with experience and expertise in acquisitions and divestitures. Neither the appointment of a trustee nor a Commission decision not to appoint a trustee under this Paragraph V of the Order shall preclude the Commission from seeking civil penalties and other relief available to it, including a court-appointed trustee, for any failure by Goodrich to comply with this Order.

Any trustee appointed by the Commission pursuant to this Paragraph V shall have the following powers, authority, duties, and responsibilities:

A. The trustee shall have the exclusive power and authority, subject to the prior approval of the Commission, to divest the La Porte VCM Plant. The trustee shall have twelve (12) months from the date of appointment to accomplish the divestiture. If, however, at the end of the twelve-month period, the trustee has submitted a plan of divestiture or believes that divestiture can be accomplished within a reasonable time, the divestiture period may be extended by the Commission.

B. The trustee shall have full and complete access to the personnel, books, records and facilities of the La Porte VCM Plant, and Goodrich shall develop such financial or other information relevant to the La Porte VCM Plant as the trustee may reasonably request. Goodrich and Diamond Shamrock shall cooperate with the trustee, and shall take no action to interfere with or impede the trustee's accomplishment of the divestiture. Any delays in divestiture caused by Goodrich or Diamond Shamrock shall extend the time for divestiture under this Paragraph V in an amount equal to the delay, as determined by the Commission.

C. The power and authority of the trustee to divest shall be at the most favorable price and terms available consistent with this Order's absolute and unconditional obligation to divest at no minimum price, and with the purposes of the divestiture as stated in Paragraph II of this Order, subject to the prior approval of the Commission.

D. The trustee shall serve, without bond or other security, at the cost and expense of Goodrich on such reasonable and customary terms and conditions as the Commission may set. The trustee shall shall have authority to retain, at the cost and expense of Goodrich, such consultants, attorneys, investment bankers, business brokers, accountants, appraisers, and other representatives and assistants as are reasonably necessary to assist in the divestiture. The trustee shall account for all monies derived from the divestiture and for all expenses incurred. After approval by the Commission of the account of the trustee, including fees for his or her services, all remaining monies shall be paid to Goodrich, and the trustee's power shall be terminated. The trustee's compensation shall be based at least in significant part on a commission arrangement contingent on the trustee divesting the La Porte VCM Plant.

E. Goodrich shall indemnify the trustee and hold the trustee harmless against any losses, claims, damages, or liabilities arising in any manner out of, or in connection with, the trustee's duties under this Order, unless the Commission determines that such losses, claims, damages, or liabilities arose out of the misfeasance, gross negligence, or the willful or wanton acts or bad faith of the trustee.

F. Promptly upon appointment of the trustee and subject to the approval of the Federal Trade Commission, Goodrich shall, subject to the Federal Trade Commission's prior approval and consistent with provisions of this Order, transfer to the trustee all rights and powers necessary to permit the trustee to effect the divestiture required by this Order.

G. If the trustee ceases to act or fails to act diligently, the Commission may appoint a substitute trustee.

H. The Commission may on its own initiative or at the request of the trustee issue such additional orders or directions as may be necessary or appropriate to accomplish the divestiture required by this Order.

I. The trustee shall have no obligation or authority to operate or maintain the La Porte VCM Plant.

J. The trustee shall report in writing to Goodrich and to the Commission every sixty (60) days concerning the trustee's efforts to accomplish divestiture.

VI

It is further ordered that Diamond Shamrock shall take no action that may interfere with the divestiture required by this Order and shall assert no right or claim, arising by contract or otherwise, against the stock or assets of the La Porte VCM Plant that may impair its operating abilities or market value; and

For a period of five (5) years from the date this Order becomes final, Diamond Shamrock shall:

A. Provide to the La Porte VCM Plant all utilities, services, and feedstock supplies (including chlorine or ethylene) requested for operation of the La Porte VCM Plant, to the same extent and on the same terms and conditions that such utilities, services or feedstock supplies were supplied by Diamond Shamrock to Goodrich at any time after January 1, 1982; and

B. Make available to the La Porte VCM Plant without charge, for its use in connection with any purchase, toll, sale, or exchange incident to the ordinary operation of a VCM plant all pipelines for transporting VCM, chlorine, or ethylene, that are connected to the La Porte VCM Plant and that are owned by Diamond Shamrock.

VII

It is further ordered that for a period of ten (10) years from the date this Order becomes final, Goodrich shall not directly or indirectly acquire—other than the acquisition of manufactured product in the ordinary course of business—all or any part of the stock or assets of, or any interest in, any producer of VCM located in the United States without the prior approval of the Federal Trade Commission.

VIII

It is further ordered that Goodrich shall, within sixty (60) days after the date this Order becomes final and every sixty (60) days thereafter until it has fully complied with the provisions of Paragraph II of this Order, submit in writing to the Commission a report setting forth in detail the manner and form in which it intends to comply, is complying, or has complied with that provision. Such compliance reports shall include, among other things that may be required from time to time, a full description of all contacts and negotiations relating to the divestiture of the La Porte VCM Plant, including the name and address of all parties contacted, copies of all written communications to and from such parties, and all internal memoranda, reports and recommendations concerning divestiture; and

Goodrich shall submit such further written reports of its compliance as the staff of the Commission may from time to time request in writing.

IX

It is further ordered that any reacquisition of all or any part of the La Porte VCM Plant by Diamond Shamrock from Goodrich shall be subject to the provisions of this Order; and if Diamond Shamrock reacquires the La Porte VCM Plant, it shall:

A. For a period of three years following such reacquisition, maintain the marketability and viability of any such reacquired assets, consistent with Paragraph II of this Order; and

B. For a period of three years following such reacquisition, obtain the prior approval of the Commission before selling all or any part of such reacquired assets, other than the sale of manufactured VCM in the ordinary course of business.

Diamond shall not, for a period of ten (10) years from the date of any such reacquisition, convey any such reacquired assets or any part thereof to Goodrich.

X

It is further ordered that Goodrich and Diamond Shamrock, upon written request and on reasonable notice, for the purpose of securing compliance with this Order, and subject to any legally recognized privilege, shall permit duly authorized representatives of the Commission or of the Director of the Bureau of Competition:

A. Reasonable access during the office hours of Goodrich or Diamond Shamrock, which may have counsel present, to inspect and copy books, ledgers, accounts, correspondence, memoranda, reports, and other records and documents in the possession or control of Goodrich or Diamond Shamrock that relate to any matter contained in this Order; and

B. Subject to the reasonable convenience of Goodrich or Diamond Shamrock, an opportunity to interview officers or employees of Goodrich or Diamond Shamrock, who may have counsel present, regarding such matters.

XI

It is further ordered that Goodrich and Diamond Shamrock shall notify the Federal Trade Commission at least thirty (30) days prior to any proposed corporate change, such as dissolution, assignment or sale resulting in the emergence of a successor corporation, the creation or dissolution of subsidiaries or any other change in the corporation, which may affect compliance with the obligations arising out of this Order.

By the Commission, Chairman Oliver, Commissioner Bailey, and Commissioner Azcuenaga concurring in part and dissenting in part.

Issued: March 15, 1988.

Benjamin I. Berman,

Acting Secretary.

Opinion of the Commission

By Calvani, Commissioner:

This case concerns an acquisition affecting the manufacture of polyvinyl chloride ("PVC") and vinyl chloride monomer ("VCM"). PVC is a thermoplastic resin that, when combined with other ingredients, can be used to produce a wide variety of plastic products, ranging from irrigation pipe to phonograph records.[1] VCM is a gaseous chemical that is an essential and primary input needed to manufacture PVC resin. This case concerns an acquisition affecting the manufacture of both products. Respondent B.F. Goodrich ("Goodrich") is a large New York corporation, headquartered in Akron, Ohio, that manufactures a wide variety of chemicals, plastics, rubber and other products worldwide. In calendar 1980, Goodrich had net sales of $3.08 billion, net income of $61.7 million, and total assets valued at $2.2 billion.[2]

Respondent Diamond Shamrock ("Diamond") is a Delaware corporation, headquartered in Dallas, Texas, whose operations include natural gas and crude oil exploration and production; petroleum refining and marketing; coal, chemicals and plastics production; and technology development. In calendar 1980, Diamond Shamrock had revenues of $3.143 billion, net income of $201 million, and total assets valued at $2.8 billion. IDF 4.

In January 1982 Goodrich acquired Diamond's largest PVC plant, its VCM plant, and certain other assets for $125 million. IDF 11 *in camera*. The Federal Trade Commission simultaneously issued the administrative complaint in this matter.[3] The complaint alleges that the acquisition violated section 7 of the Clayton Act, 15 U.S.C. 18, and section 5 of the Federal Trade Commission Act, 15 U.S.C. 45. More particularly, the complaint alleges that the acquisition would eliminate actual competition between Goodrich and Diamond and increase concentration levels in two product markets: the bulk and suspension PVC market and the VCM market. Administrative Law Judge Howder dismissed the complaint with respect to both markets, because in his view "the record shows that competition among producers is ongoing, vigorous and intense." ID at 95.

As explained in detail below, the Commission has concluded that the acquisition may substantially lessen competition in the VCM market, but is unlikely to lessen competition substantially in the PVC market.

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[1] A thermoplastic resin becomes soft and malleable when heated, and therefore can be fabricated by applying heat and pressure. By contrast, thermosetting plastics do not return to a malleable state upon reheating.

[2] IDF 1. The following abbreviations are used in this opinion:

ID—initial decision page number

IDF—initial decision finding number

Tr.—transcript of testimony page number

CX—complaint counsel's exhibit number

CAB—complaint counsel's appeal brief

CRB—complaint counsel's reply brief

CPF—complaint counsel's proposed finding of fact number

CRF—complaint counsel's reply finding of fact number

RX—respondents' exhibit number

RAB—respondents' answering brief

RPF—respondents' proposed finding of fact number

RRF—respondents' reply finding of fact number

This opinion, and the opinions of Chairman Oliver and Commissioner Azcuenaga, contain some references to material in the *in camera* portion of the record. Pursuant to an order issued on February 8, 1988, the Commission has determined, without objection from the submitting parties, to place these references on the public record of this proceeding.

[3] PVC is currently the subject of another Commission proceeding. In April 1986 the Commission issued an administrative complaint challenging Occidental Petroleum's acquisition of two PVC plants from Tenneco Polymers. The Commission also sought a preliminary injunction against the transaction. The district court denied that application, but its decision was later vacated as moot. *FTC v. Occidental Petroleum Corp.*, 1986-1 Trade Cas. (CCH) ¶ 67,071 (D.D.C. April 29, 1986), *vacated as moot*, No. 86-5254 (D.C. Cir. Oct. 23, 1986).

Accordingly, the Commission affirms the decision of Judge Howder with respect to the PVC market, and reverses with respect to the VCM market.

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I. Statement of Facts

At the time of the acquisition, Goodrich operated bulk or suspension PVC facilities—with a total nameplate capacity of over one billion pounds per year—in Avon Lake, Ohio; Henry, Illinois; Long Beach, California; Louisville, Kentucky; Pedricktown, New Jersey; and Plaquemine, Louisiana. CX 4Z73. It also operated a VCM plant with a nameplate capacity of approximately one billion pounds per year in Calvert City, Kentucky. IDF 3 *in camera*. At the time of the acquisition, Diamond operated several bulk and suspension PVC facilities—with a total nameplate capacity of 590 million pounds per year—in Deer Park, Texas and Delaware City, Delaware. IDF 5 *in camera*. Its Deer Park facilities included several specialty PVC resin plants (plants numbers 1, 3, 4 and 4X), with a combined practical production capacity of 215 million pounds per year; one large commodity PVC resin plant (plant number 5), with a practical production capacity of 260 million pounds per year; and a powder compound plant, with a capacity of 152 million pounds per year. Diamond also operated a VCM facility with a nameplate capacity of one billion pounds per year at LaPorte, Texas, adjacent to its Deer Park facility.[4]

In July 1979 Goodrich announced that it intended to double its PVC capacity by 1986.[5] In 1980, it announced that it would execute that strategy by constructing a 1.6 billion pound per year VCM plant and a 1.1 billion pound year suspension PVC plant at Convent, Louisiana.[6] Goodrich privately described its plans in 1981 as a successful "preemptive" strategy designed to

> freeze the competition into inaction, thereby delaying expansions and forestalling new entrants into the business * * *. This preemptive strategy, reinforced by the 1980 recession, has been quite successful to date * * * No new expansions beyond 1983 have been announced by any competitor. New entries in PVC have been forestalled * * * We have also seen consolidation occurring within the industry * * * the Diamond Shamrock and Air Products PVC businesses are for sale. As a result of all of the above developments, as well as the industry perception of our commitment, we are in an excellent competitive position to move ahead with our plans.[7]

These developments helped Diamond to conclude that its plastics business would not satisfy new corporate financial targets; it also believed that selling the business would provide capital for expansion in other areas.[8] Diamond therefore organized its plastics business into a new subsidiary, Diamond Shamrock Plastics Corporation ("DSPC"). IDF 7. Several firms expressed interest, and between September 1980 and September 1981 Diamond negotiated most actively with [ ] firm. CPF 1.26 *in camera*. In August 1980 Diamond rejected a Goodrich proposal, in part because it believed that such an acquisition would present antitrust problems. However, Diamond subsequently changed its mind, and in August 1981 began negotiating actively with Goodrich.[9] Although Goodrich believed that Diamond duplicated rather than complemented its own PVC capabilities, with "only a suggestion of synergy," it viewed the acquisition as "an attractive defense against acquisition [of Diamond] by another PVC producer."[10]

In the course of their negotiations Goodrich and Diamond agreed that only Diamond's large commodity grade plant (number 5) would be directly transferred to Goodrich, while Diamond would retain the four Deer Park small reactor specialty PVC plants (numbers 1, 3, 4, and 4X) and operate them for Goodrich.[11] At a meeting on September 9, 1981, Goodrich and Diamond discussed the shutdown of Diamond's remaining plants, and tentatively agreed that the Delaware City plant would be shut down as soon as possible, while the remaining Deer Park plants would be operated for "at least a year."[12] In late September 1981, Diamond and Goodrich reached an agreement in principle on the acquisition. Goodrich Admission 297 (CX 4Z12). In January 1982, Goodrich acquired Diamond's Deer Park plant number 5, its VCM plant, and certain other assets for $125 million.[13] Goodrich

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[4] IDF 5–6 *in camera*; Goodrich Admissions 1, 15, 21, 23 (CX 4A, C–E); RX 320M, P; CX 11B *in camera*. The record indicates that Diamond continues to hold a fifty percent interest in a 220 million pound per year bulk PVC plant in Alberta, Canada. RX 320S–T.

[5] DiLiddo, Tr. 3335; CX 38C *in camera; see* CX 109D, Z4 *in camera*.

[6] DiLiddo, Tr. 3131, 3135–36, 3178–79; CX 8B; CX 38C *in camera*. A joint venture between Goodrich and Bechtel Petroleum was already constructing a chlor-alkali and ethylene dichloride complex at the same location; that facility was completed in 1981. CX 8B; Goodrich Admission 665 (CX 4Z62); DiLiddo, Tr. 3131; CX 38C *in camera*.

[7] CX 47B; *accord* CX 59D *in camera*; DiLiddo, Tr. 3170–74; CX 49R; CX 56A *in camera*; CX 57C–E *in camera*.

[8] CX 112G–H; CX 541F *in camera*; Diamond Admissions 294, 295, 297 (CX 6M); Becker, Tr. 1342–48; CX 401E; CX 402B; CX 403A–B.

[9] Schaefer, Tr. 1092–93, 1106–07; CX 295Z75–76 *in camera*; Arp, Tr. 3458, 3476.

[10] CX 34A *in camera; see* Klass, Tr. 4963 *in camera*. These statements suggest that the acquisition did not increase efficiency to a significant degree.

[11] CX 60A *in camera*; CX 197A *in camera*.

[12] CX 60A *in camera*. In a September 1981 internal memorandum, Goodrich outlined some of the terms of the transaction as follows: DS will operate DP small poly plant for BFG for two years with option to extend a third year. Upon 6 mos. notice BFG can terminate small poly operations. DS & BFG will jointly develop a shutdown plan.

CX 115C, H *in camera*. Respondents argue that this document was "a summary of the key points of the negotiation," rather than a description of the agreement, and that Goodrich and Diamond did not agree that Deer Park plants 1 through 4X would ultimately be shut down. RRF at 14–16, *citing* DiLiddo, Tr. 3198; Schaefer, Tr. 1183; Becker, Tr. 1357–58. However, the document is dated September 11, 1981, and Diamond and Goodrich reached an agreement in principle in late September. In any event, the Delaware City plant was subsequently sold to Ethyl Corporation, rather than shut down. *See* page 10, *infra*.

[13] IDF 10–11 *in camera*. The other assets Goodrich acquired included Diamond's suspension PVC production technology and formulations; its suspension PVC and powder compound inventories; its PVC and VCM railcars; its research and development resources; and various patents. IDF 12 *in camera*. They also included Diamond's Deer Park powder compound plant, which had been used to supply compounded PVC resin to PVC pipe producers. CX 452. As a part of the sales agreement, Diamond also agreed to supply ethylene and chlorine feedstocks to Goodrich—and to manufacture suspension PVC for Goodrich using Goodrich VCM—on an interim basis. IDF 13 *in camera*.

subsequently cancelled its plan to build a VCM plant at Convent, Louisiana, and wrote off the $27 million it had thus far invested in the project as a loss.[14]

Goodrich and Diamond believed that the sale of Deer Park plant number 5 to Goodrich effectively precluded the sale of plants numbers 1, 3, 4, and 4X to another firm, and that these plants would be closed within two years.[15] However, Diamond agreed to toll needed raw materials from Goodrich and use the plants to supply speciality grades of suspension PVC resin for resale by Goodrich.[16] As a result, Goodrich was able to assume responsibility for supplying specialty resins to Diamond's customers.[17] After Goodrich established itself as the supplier for these accounts, and Diamond dissolved its PVC marketing organization, Goodrich shifted the source of supply from plants 1, 3, 4, and 4X to one of its own plants. *See* CX 570B.

After the first year of the tolling arrangement, Goodrich determined to minimize Diamond's suspension PVC production as much as possible, but to continue to take all the suspension PVC Diamond produced until Diamond shut down the remaining Deer Park plants.[18] Goodrich perceived this strategy as

> the only option that keeps Diamond from being a disruptive force in the market place. Since they have no sales force, if we don't take their resin, they will be able to only sell the resin based on price and this could have a devastating effect on overall industry pricing.

CX 117A. In April 1982 Diamond sold its Delaware City PVC plant to Ethyl Corporation, and by December 1983 Diamond had closed or sold all its remaining PVC plants and disbanded its plastics division. IDF 14 *in camera*.

II. Section 7 of the Clayton Act

Section 7 of the Clayton Act prohibits acquisitions that may substantially lessen competition or tend to create a monopoly; that is, that create a reasonable likelihood of anticompetitive effects.[19] As the Court of Appeals for the Seventh Circuit indicated recently in affirming the Commission decision in *HCA*, the crucial question is

> whether the challenged acquisition is likely to hurt consumers, as by making it easier for the firms in the market to collude, expressly or tacitly, and thereby force price above or farther above the competitive level * * * the ultimate issue is whether the challenged acquisition is likely to facilitate collusion * * * the worry is that [the acquisition] may enable the acquiring firm to cooperate (or cooperate better) with other leading competitors on reducing or limiting output, thereby pushing up the market price.[20]

The Court went on to point out:

> Section 7 does not require proof that a merger or other acquisition has caused higher prices in the affected market. All that is necessary is that the merger create an appreciable danger of such consequences in the future. A predictive judgment, necessarily probabilistic and judgmental rather than demonstrable * * * is called for.[21]

In short, if an acquisition creates an "appreciable danger" of anticompetitive effects such as supracompetitive prices, then it violates section 7 of the Clayton Act.

III. Relevant Markets

The first step in determining whether a particular acquisition satisfies the foregoing standard is to delineate the relevant geographic and product markets.[22] As the Supreme Court has indicated,

> determination of the relevant market is a necessary predicate to a finding of a violation of the Clayton Act because * * * [s]ubstantiality can be determined only in terms of the market affected.[23]

A. Relevant Geographic Market

Relevant geographic markets can be delineated by measuring cross elasticities of supply and demand; that is, by determining the degree to which—within a given period of time—price changes in one area will induce changes in the quantities of the relevant product demanded in and supplied from other areas, with all other factors affecting supply and demand held constant.[24] Thus, the Supreme Court has determined that,

> [t]he area of effective competition in the known line of commerce must be charted by careful selection of the market area in which the seller operates and to which buyers can practicably turn for supplies.[25]

Consistent with that position, the Commission has determined that "the relevant geographic market must be broad enough that buyers would be unable to switch to alternative sellers in sufficient numbers to defeat an exercise of market power by firms in the area."[26] Similarly, the Department of Justice has concluded that an area is probably a relevant geographic market if a firm or a group of colluding firms within the area could "profitably impose a 'small but significant and nontransitory' increase in price"—in most contexts, a five percent increase lasting one year—without (1) inducing a significant number of buyers to shift to firms outside the area, or (2) inducing a significant number of sellers outside the area to begin selling inside the area.[27] It is often difficult to measure these effects directly, either by calculating cross-elasticities of supply and demand, or by calculating the degree to which firms within the area could in fact exercise market power.[28] Surrogates

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[14] DiLiddo, Tr. 3187–88, 3396.

[15] Schaefer, CX 295 Z97 *in camera*; CX 115C *in camera; see* CX 11J *in camera*.

[16] Under most tolling arrangements, a firm agrees to manufacture product for another firm using raw materials supplied by the other firm. Kienholz, Tr. 845–46.

[17] *See* CX 567; CX 570B.

[18] Beginning in March 1982 Diamond sold over 90 percent of its PVC production to Goodrich, pursuant to the tolling agreement. CX 300Z10 *in camera*; CX 117A–B.

[19] *Hospital Corporation of America*, 106 F.T.C. 361, 464 (1985) (*hereinafter HCA*), *aff'd*, 807 F.2d 1381 (7th Cir. 1986), *cert. denied*, ____ U.S. ____, No. 86–1492 (May 3, 1987); *Echlin Manufacturing Co.*, 105 F.T.C. 410, 483 (1985); *B.A.T. Industries, Ltd.*, 104 F.T.C. 852, 919 (1984).

[20] *Hospital Corporation of America v. FTC*, 807 F.2d 1381, 1386 (7th Cir. 1986), *cert. denied*, ____ U.S. ____, No. 86–1492 (May 3, 1987) (*hereinafter HCA v. FTC*); *accord, HCA*, 106 F.T.C. at 477.

[21] *HCA v. FTC*, 807 F.T.C. at 1389 (citation omitted); *accord, United States v. General Dynamics Corp.*, 415 U.S. 486, 505 (1974); *HCA*, 106 F.T.C. at 499 ("actual anticompetitive effects need not be shown; an acquisition is unlawful if such an effect is reasonably probable").

[22] As the Commission has noted, one could arrive at relatively precise estimates of market power—without proceeding through the market definition-market structure paradigm—if one could measure "all relevant demand and supply elasticities." *Federal Trade Commission Statement Concerning Horizontal Mergers*, 2 Trade Reg. Rep. (CCH) ¶4516 (June 14, 1982) (*hereinafter FTC Statement*), at 6901–3. However, as the Commission has also noted, such evidence "is rarely, if ever, available, and is not readily susceptible to direct measurement." *Id. But see* Baker and Bresnahan, *The Gains From Merger or Collusion in Product-Differentiated Industries*, 33 J. Indus. Econ. 427 (1985) (direct assessment of market power through residual demand curve estimation).

[23] *United States v. E.I. duPont de Nemours & Co.*, 353 U.S. 586, 593 (1957); *accord United States v. Marine Bancorporation*, 418 U.S. 294,602, 618 (1974); *Brown Shoe Co. v. United States*, 370 U.S. 324 (1962); *Domed Stadium Hotel, Inc. v. Holiday Inn, Inc.* 732 F.2d 480, 491 (5th Cir. 1984); *Weyerhaeuser Co.*, 106 F.T.C. 172, 274 (1985); *American Medical International*, 104 F.T.C. 1, 190–191 (1984) (*hereinafter AMI*).

[24] *Weyerhaeuser Co.*, 106 F.T.C. at 274; *Grand Union Co.*, 102 F.T.C. 812, 1039–40 (1983); *Beatrice Foods Co.*, 101 F.T.C. 733, 836 (1983) (Douglas, Commissioner, and Miller, Chairman, concurring); *FTC Statement*, ¶4516 at 6901–7.

[25] *Tampa Electric Co. v. Nashville Coal Co.*, 365 U.S. 320, 327 (1961); *accord United States v. Philadelphia National Bank*, 374 U.S. 321, 359 (1963).

[26] *HCA*, 106 F.T.C. at 466.

[27] *Justice Department Merger Guidelines*, 2 Trade Reg. Rep. (CCH) ¶4490 *et seq.* (1984) (*hereinafter DOJ Guidelines*) at ¶¶2.11, 2.31.

[28] *But see* Scheffman and Spiller, *Geographic Market Definition Under the United States Department of Justice Merger Guidelines*, 30 J. L. & Econ. 123 (1987) (operationalizes *DOJ Guidelines* market definition algorithm by estimating residual demand elasticities).

such as persistent price differences; price change differences; similarities or differences in price movements; impediments to trade, such as transportation costs that are high relative to product value; shipment patterns and transshipment levels; and industry perceptions therefore may be used.[29] Imports that could profitably enter the market within one year in response to a "small but significant and nontransitory" price increase should also be included.[30]

In this case, the parties have stipulated that the United States as a whole is the relevant geographic market (IDF 15), a delineation that is consistent with the record evidence.

B. Relevant Product Market

A relevant product market can also be delineated by measuring cross-elasticities of supply and demand; that is, by determining the degree to which—within a given period of time—changes in the price of a given product or service will induce changes in the quantities of a second product or service that are demanded or supplied.[31] Thus, the Supreme Court has concluded that both demand and supply substitutability are relevant to determining the contours of a relevant product market.[32] Consistent with that position, the Commission seeks "to define a product or group of products sufficiently distinct that buyers could not defeat an attempted exercise of market power on the part of sellers of those products by shifting purchases to still different products."[33] Similarly, the Justice Department has concluded that a given item constitutes a relevant product if its manufacturer could "profitably impose a 'small but significant and nontransitory' increase in price"—in most contexts, a five percent increase lasting one year—without (1) inducing a significant number of buyers to begin purchasing substitute products, or (2) inducing a significant number of manufacturers of other products to begin producing the product at issue.[34] It is often difficult to measure these effects directly, either by calculating cross-elasticities of supply and demand, or by calculating the degree to which firms within the postulated product market could in fact exercise market power. Surrogates such as distinctive uses or characteristics, industry firm perceptions, and persistent price differences over time may therefore be considered.[35]

1. Bulk and Suspension Polyvinyl Chloride

PVC is manufactured from ethylene, a petroleum compound, and chlorine.[36] These chemicals are first converted into ethylene dichloride, which is then "cracked" to produce vinyl chloride monomer ("VCM"). VCM molecules are then linked into chains ("polymerized") by heating them in the presence of certain catalysts. IDF 17, 19. Approximately 85 percent of all PVC manufactured in the United States is classified as "suspension PVC." IDF 21; Disch, Tr. 627–28. It is produced by adding suspension agents to VCM, in the presence of water and catalysts, thereby producing large PVC particles while using smaller amounts of energy than other processes require. IDF 21; Disch, Tr. 627–29. Approximately 5 percent of all PVC manufactured in the United States is classified as "bulk PVC." It is produced by polymerizing VCM without adding any liquids, producing a purer product suitable for end use applications requiring greater optical clarity, such as packaging materials.[37]

When combined with other ingredients, such as stabilizers, plasticizers or impact modifiers,[38] PVC resin can be used to manufacture a wide variety of products, including pipe and pipe fittings, wire and cable insulation, packaging film for meat and produce, vinyl siding, floor tile, bottles, medical and surgical tubing, records, and vinyl window frame components. IDF 18 *in camera*. In 1981, approximately 5.242 billion pounds of PVC were produced for domestic consumption; by 1983 that total had increased to 5.635 billion pounds.[39] During the 1981–1983 period, approximately 43 to 44 percent of total PVC resin consumed was used to produce pipe and pipe fittings;[40] 20 to 25 percent was used to produce calendered products;[41] 10 percent was used in wire and cable applications (IDF 147); and 6 to 7 percent was used for packaging film and sheet.[42]

The parties have stipulated that the production of bulk and suspension PVC is a relevant product market (IDF 16), a delineation that is consistent with the record evidence. Firms that currently purchase PVC resin to manufacture PVC end use products cannot substitute other inputs in response to a small increase in PVC resin prices; there are simply no substitutes for PVC resin as an input to produce these products.[43] Moreover,

[29] *United States v. General Dynamics Corp.*, 415 U.S. 486, 490–91 and n.3 (1974); *Grand Union Co.*, 102 F.T.C. at 1041; *FTC Statement*, ¶4516 at 6901–7; *DOJ Guidelines* at ¶2.32.

[30] *See, e.g., HCA*, 106 F.T.C. at 466–467. On the other hand, imports that could profitably enter the market within twelve months to two years are treated as new entry under the DOJ Guidelines. *DOJ Guidelines* at ¶3.3. Here, in view of the parties' stipulation that the United States constitutes the relevant geographic market, we consider respondents' arguments concerning the impact of imports in our analysis of entry conditions. *See* pages 36–38, 42–43, *infra*.

[31] *Grand Union Co.*, 102 F.T.C. at 1039–40; *Beatrice Foods Co.*, 101 F.T.C. at 830 (Douglas, Commissioner, and Miller, Chairman, concurring); *FTC Statement*, ¶4516 at 6901–6.

[32] *Brown Shoe Co. v. United States*, 370 U.S. 294, 325 and n.42 (1962); *United States v. Columbia Steel Corp.*, 334 U.S. 495, 510–511 (1948); *see also United States v. E. I. dePont de Nemours & Co.*, 351 U.S. 377 (1956).

[33] *HCA*, 106 F.T.C. at 464, 466.

[34] *DOJ Guidelines* at ¶2.11.

[35] *Grand Union Co.*, 102 F.T.C. at 1041; *FTC Statement*, ¶4516 at 6901–6 through 6901–7; *DOJ Guidelines* at ¶2.12.

[36] Chlorine is produced by applying an electrical current to brine; the process yields one pound of chlorine to 1.1 pounds of caustic soda. Chlorine is highly volatile and corrosive, and therefore cannot be stored economically. RPF 45, 46. Ethylene is manufactured by cracking petroleum feedstocks such as ethane, propane, butane or naphtha. RPF 49.

[37] IDF 23; Disch Tr. 629, 633. The remaining 8 to 10 percent of PVC manufactured in the United States is produced through a "dispersion process," in which emulsifying agents are used, in conjunction with an expensive spray drying process, to produce very small PVC particles. IDF 22; Disch, Tr. 630. The complaint also alleged a violation in the dispersion PVC market, but complaint counsel elected not to pursue—and presented no evidence concerning—that allegation at trial. ID at 2 n.2. Bulk and suspension PVC resins have "quite different" applications than dispersion resins. Disch, Tr. 634. In order to simplify the discussion, the term "PVC" in this opinion refers to bulk and suspension PVC, and not to dispersion PVC.

[38] These ingredients are added to PVC resins to produce PVC compounds, which are used in turn to manufacture PVC end use products. Disch, Tr. 655–58.

[39] *See* Tables I and II, *Infra*.

[40] IDF 99; Disch, Tr. 663. This end use includes municipal water pipe (200 million pounds of PVC resin in 1983); rural water pipe (340 million pounds); water services and distribution pipe (260 million pounds); sewer and drain pipe (480 million pounds); drain, waste and vent pipe (450 million pounds); irrigation pipe (150 million pounds); communications duct (280 million pounds); and electrical conduit (120 million pounds). IDF 109, 121, 123, 127, 133, 138, 142, 144 (amounts *in camera*).

[41] IDF 190. Calendered products are produced through "calendering," in which large heated rolls are used to produce wide sheets of PVC material. Rigid calendered sheet is used to manufacture rigid products such as decorative laminates and credit card stock. Flexible calendered sheet is used to manufacture more flexible products such as wall coverings, upholstery, automotive interiors and landau tops, luggage, wallets, raincoats, footwear, and a variety of other products. IDF 190 and ID at 58 n.40.

[42] IDF 152. The remaining approximate percentages of the total over the 1981–1983 period were devoted to vinyl siding and accessories (5 percent); floor tile (3–4 percent); bottles (3–4 percent); medical applications (2 percent); phonograph records (2–3 percent); and windows (1 percent). IDF 154, 165, 169, 179 (and Table I), 185, 189 (and Table I) (percentages *in camera*); Disch, Tr. 664.

[43] There are, of course, substitutes for the end products made from PVC resin. They are discussed in detail in Part IV.C.2.a., *infra*.

firms producii g other products are unlikely to switch to producing PVC in response to a small increase in PVC resin prices, because the machinery needed to produce PVC is essentially unique to that application. *See* Disch, Tr. 663.

2. Vinyl Chloride Monomer

VCM is a "gaseous, reactive, acyclic intermediate chemical" under atmospheric temperature and pressure.[44] It is produced by thermally cracking purified ethylene dichloride at high temperatures. Ethylene dichloride is produced, in turn, by either oxyhydrochlorinating or directly chlorinating ethylene. IDF 32; Kienholz, Tr. 757–58. Approximately 0.6 pound of chlorine and 0.49 pound of ethylene are used to manufacture one pound of VCM. CPF 2.18 *in camera;* RPF 41 *in camera.* Small amounts of VCM are used to produce other plastics, but over 95 percent of the VCM consumed in the United States is used to manufacture PVC. IDF 31. Approximately 1.02 to 1.04 pounds of VCM are required to manufacture one pound of PVC. Kaserman, Tr. 2456. A substantial amount of processing—accounting for approximately 37 to 45 percent of the cost of producing PVC—is required to convert VCM into PVC. [45] In 1981, 6.856 billion pounds of VCM were produced for domestic consumption; by 1983 that total had increased to 7.033 billion pounds.[46]

Complaint counsel argued—and Judge Howder agreed—that VCM constitutes a relevant product market. IDF 16; CAB at 7 and n. 11; CRB at 53–56. Respondents agree that "VCM is a product without substitutes, produced by distinct companies utilizing unique facilities." RPF 228 *in camera.* They argue, however, that VCM is not a relevent market "that could be subject to the exercise of market power" because VCM's only utility is in the manufacture of PVC and because VCM is "virtually fully integrated" into PVC by ownership or long term contracts. As a result, according to the respondents, "VCM and PVC producers are engaged in a single business, with the price of PVC determining revenues for all participants." [47]

We conclude that VCM is a relevant product market for the purpose of section 7 analysis. Even if the respondents' analysis were to apply if VCM and PVC were completely integrated, the record shows that the degree of vertical integration by ownership between VCM and PVC is neither complete nor symmetrical. IDF 78. Before the Goodrich acquisition, nonintegrated producers accounted for 46.9 percent of VCM practical production capacity and approximately 44.6 percent of PVC practical production capacity.[48] Accordingly, there is a market in which VCM is bought and sold that could be subject to the exercise of market power. The long term VCM supply contracts to which the respondents refer typically give the firms they cover independent discretion as to the quantity they will buy or sell, and their customers and sources of supply.[49] Moreover, under most VCM supply contracts, neither the price nor the quantity is fixed; instead, both are subject to negotiation on a frequent basis. In addition, contract prices are often closely tied to VCM market prices by meeting competition clauses or specific references to competitors' VCM prices. Furthermore, even firms that are vertically integrated by ownership participate in the VCM market from time to time as either buyers or sellers of VCM, through sales, purchases and exchanges keyed to the market price of VCM. IDF 296–301 *in camera.*

From the perspective of the demand and supply elasticity analysis outlined above, the Commission therefore has concluded that VCM should be classified as a separate product market. A small increase in VCM prices is not likely to induce a significant increase in the quantity of a competing product that is demanded, because there are no substitutes for VCM, which must be used in fixed proportions to produce PVC.[50] In fact, one Goodrich document describes demand for VCM as "absolutely inelastic." [51] Moreover, a small increase in VCM prices is not likely to induce producers of other products to switch to supplying VCM; no plants currently producing other products could be shifted into VCM production.[52] Thus, a group of colluding firms in the VCM market could sustain a price increase of at least five percent for at least one year.

As noted *supra,* a number of PVC producers—including Goodrich and Diamond at the time of the acquisition—also produce VCM. The Commission has determined that "captive production" of this type

> should ordinarily be treated as part of the relevant product market in merger cases when, as the Justice Department has suggested, a "small but significant and nontransitory" price increase in likely to induce vertically integrated firms to increase production of the relevant product, either for outside sales or to increase their own downstream sales.[53]

Under this standard, internally consumed VCM should be treated as part of the VCM market. Integrated VCM producers could respond to VCM price increases initiated by nonintegrated producers by increasing VCM production, either for sale or for producing additional quantities of PVC.[54] VCM producers consider both independent and integrated VCM producers to be competitors in supplying PVC producers, and PVC producers secure VCM from both integrated and nonintegrated sources.[55] Any effort among nonintegrated VCM producers to collude could not succeed without the cooperation or acquiescence of integrated producers.[56]

IV. Structural Factors

The foregoing discussion establishes that the PVC market and the VCM market are relevant product markets, and that the United States is the relevant geographic market. The next step is to determine whether the acquisition at issue may substantially lessen competition by facilitating collusive conduct (or other anticompetitive behavior) among the

[44] IDF 30. VCM is normally stored and transported as a liquid under pressure. L. Wheeler, Tr. 917.

[45] *See e.g.,* RX 1213H *in camera.*

[46] *See* Tables IV and V, *infra.*

[47] RAB at 57. However, the respondents' economic expert testified that VCM "may likely meet" the *DOJ Guidelines* criteria for a market "and thus is a market definition concept that I can work with." Klass, Tr. 4473–74.

[48] *See* Table VII, *infra.* In *Weyerhaeuser Co.,* 106 F.T.C. 172, 271 (1985), the Commission found that corrugating medium was a relevant product market, even though only 12 percent of corrugating medium consumed was sold on the open market.

[49] For example, under a contract between Shell and Tenneco, Tenneco may resell any or all of the VCM it purchases from Shell; Shell may sell VCM to other firms; Tenneco may buy VCM from other firms; and Shell controls the factors that determine contract prices. Disch, Tr. 703–04, 726–27.

[50] Kaserman, Tr. 2456; L. Wheeler, Tr. 919 *in camera.*

[51] Lefebvre, CX 296Z *in camera.*

[52] Klass, Tr. 4706–07; Kaserman, Tr. 2455–56; Kienholz, Tr. 821; L. Wheeler, Tr. 990.

[53] *B.A.T Industries, Ltd.,* 104 F.T.C. at 934, *citing DOJ Guidelines at* ¶ 2.23; *accord Spectrofuge Corp.* v. *Beckman Instruments, Inc.,* 575 F.2d 256, 278 (5th Cir. 1978), *cert. denied,* 440 U.S. 939 (1979); *International Tel. & Tel.* v. *General Tel. & Elecs. Corp.,* 518 F.2d 913, 930 (9th Cir. 1975). *But see Grumman Corp.* v. *LTV Corp.,* 665 F.2d 10, 13–14 (2d Cir. 1981).

[54] Kaserman, Tr. 2456–59.

[55] L. Wheeler, Tr. 932 *in camera;* Kienholz, Tr. 786, 856–57; Klass, Tr. 3998, 4008; Taylor, Tr. 1563–65, 1623.

[56] Kaserman, Tr. 2458–59; *see* Klass, Tr. 1049–52.

firms remaining in the industry. As the Commission has stated, the legal analysis of horizontal mergers "'has focused on the extent to which the mergers * * * enhance the ability of firms to collude, either expressly or tacitly.'"[57] The Seventh Circuit has confirmed that the issue is

> whether the challenged acquisition is likely to facilitate collusion . . . the worry is that [the acquisition] may enable the acquiring firm to cooperate (or cooperate better) with other leading competitors in reducing or limiting output, thereby pushing up the market price.

HCA v. *FTC*, 807 F.2d at 1386.

The effective coordination of price and output strategies requires developing a consensus concerning price and output levels, and a means of enforcing its terms.[58] The first step requires harmonizing the incentives of participating firms and mitigating firm uncertainty concerning rival firms, so that they can effectively coordinate their behavior.[59] The second step requires creating circumstances in which the prospective value to each participating firm of cheating on the consensus does not exceed the prospective loss from rival firm retaliation.[60] In order to create and maintain these circumstances, participating firms must be able to monitor rival firm conduct; that is, they must be able to detect cheating on the consensus. They must also be able to retaliate effectively if and when cheating occurs.

Structural conditions within an industry are crucially important to determining the feasibility of collusion, and consequently to determining whether a particular merger or acquisition is likely to have anticompetitive effects. An industry in which an acquisition is most likely to have anticompetitive effects will be characterized by the following attributes: (1) Relatively high barriers or impediments to entry; (2) a relatively high level of concentration; (3) a low level of product differentiation, and a low level of geographic differentiation occasioned by transportation cost differences; (4) a relatively inelastic demand for industry output at competitive price levels; (5) insignificant intra-industry differences in cost functions; (6) a large number of small buyers; (7) a high degree of transaction frequency and visibility; and (8) relatively stable and predictable demand and supply conditions.[61] Not all of these criteria need to be satisfied in order to establish that an acquisition may substantially lessen competition, but they are all relevant to one degree or another. This part of the Opinion analyzes each of these factors in detail. In addition, it evaluates the competitive significance of vertical integration between the VCM and PVC markets.

A. Barriers and Impediments to Entry

The absence of barriers or impediments to entry makes it highly unlikely that a merger or acquisition will have anticompetitive effects, because any effort to extract supracompetitive prices and profits will induce new entry, which will reduce prices to competitive levels. Even if new entrants are willing to participate in an ongoing effort to coordinate price and output levels, accommodating their conflicting incentives is likely to be difficult. The Supreme Court has therefore recognized that an evaluation of the likely competitive effects of an acquisition should include an appraisal of the potential for competition from firms not currently in the relevant market. For example, in *United States* v. *Falstaff Brewing Corp.*, the Court noted that although Falstaff did not currently sell the relevant product in the relevant geographic market, it clearly possessed the potential to enter relatively easily, and therefore constrained the pricing discretion of incumbent firms.[62]

For similar reasons, the Commission has concluded that in the absence of barriers or impediments to entry, an acquisition cannot have anticompetitive effects, and therefore cannot violate section 7 of the Clayton Act.[63] The Justice Department has taken the same position:

> If entry into a market is so easy that existing competitors could not succeed in raising price for any significant period of time, the Department is unlikely to challenge mergers in that market.

DOJ Guidelines at ¶3.3. By contrast, high entry barriers "increase the probability that market power will result from an acquisition."[64] The Commission has defined entry barriers as additional long-run costs that must be incurred by an entrant, but that were not incurred by incumbent firms.[65] The Commission has noted that a long-run differential could create "a permanent barrier to new entry" that would permit incumbent firms to secure supracompetitive prices and profits indefinitely.[66] Governmental restrictions may create such a barrier,[67] and environmental regulations represent an example.[68] The Commission has

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[57] *Weyerhaeuser Co.*, 106 F.T.C. at 273–274, *quoting FTC Statement*, ¶ 4516 at 6901–2. This case does not involve the alternative situation in which an acquisition permits a single firm to acquire or enhance market power approaching monopoly proportions.

[58] *See, e.g.*, R. Posner, *Antitrust Law: An Economic Perspective* 51 (1976); Salop, *Practices That (Credibly) Facilitate Oligopoly Coordination*, in *New Developments In the Analysis of Market Structure* (J. Stiglitz and G. F. Mathewson eds. 1986); Hay, *Oligopoly, Shared Monopoly, and Antitrust Law*, 67 Cornell L. Rev. 439, 445 (1982); Clark, *Price-Fixing Without Collusion: An Economic Analysis of Facilitating Prictices After Ethyl Corp.*, 1983 Wis. L. Rev. 887, 891 (1983).

[59] *E.g.*, Clark, *supra* note 58, at 892.

[60] *E.g.*, *id.* at 893.

[61] *See, e.g.*, *Ethyl Corp.*, 101 F.T.C. 425, 602–03, 607–09 (1983), *rev'd on other grounds sub nom. E.I. du Pont de Nemours & Co.* v. *FTC*, 729 F.2d 128 (2d Cir. 1984); *FTC Statement* ¶ 4516 at 6901 through 6901–5; *DOJ Guidelines* at ¶ 3.2; Posner, *supra* note 58, at 55–61; P. Areeda, *Antitrust Analysis* ¶ 262 (1981); F. Scherer, *Industrial Market Structure and Economic Performance* 171–72 (2d ed. 1980); G. Stigler, *The Organization of Industry* 39–45 (1968); Markham, *The Nature and Significance of Price Leadership*, 41 Amer. Econ. Rev. 891, 901–03 (1951); Clark, *supra* note 58, at 894–99. *See generally United States* v. *Citizens & Southern National Bank*, 422 U.S. 86, 120–22 (1975); *United States* v. *General Dynamics Corp.*, 415 U.S. 486, 503–05 (1974).

[62] *United States* v. *Falstaff Brewing Corp.*, 410 U.S. 526, 531–34 (1973); *accord FTC* v. *Procter & Gamble Co.*, 386 U.S. 568, 581 (1967); *United States* v. *Penn-Olin Chemical Co.*, 378 U.S. 158, 173–74 (1964); *see also United States* v. *Philadelphia National Bank*, 374 U.S. at 367 and n. 44.

[63] *Echlin Manufacturing Co.*, 105 F.T.C. at 484, 487; *accord United States* v. *Waste Management, Inc.*, 743 F.2d 976, 981–984 (2d Cir. 1984); *United States* v. *Calmar Inc.*, 612 F. Supp. 1298, 1305 (D.N.J. 1985); *United States* v. *Tracinda Investment Corp.*, 477 F. Supp. 1093, 1108 (C.D. Cal. 1979); *United States* v. *M.P.M., Inc.*, 397 F. Supp. 78, 92, 94 (D. Colo. 1975); *HCA*, 106 F.T.C. at 489; *FTC Statement*, ¶ 4516 at 6901–3 ["if entry barriers are very low it is unlikely that market power, whether individually or collectively exercised, will persist for long."]; *see B.A.T Industries, Ltd.*, 104 F.T.C. at 919; *Grand Union Co.*, 102 F.T.C. at 1063. Hence, in evaluating the prospect of anticompetitive effects from a particular acquisition, the Commission must first determine whether any barriers or impediments to entry make the sustained exercise of market power feasible.

[64] *Grand Union Co.*, 102 F.T.C. at 1063–64; *accord FTC Statement*, ¶ 4516 at 6901–3.

[65] *Echlin Manufacturing Co.*, 105 F.T.C. at 485, *citing, e.g.*, G. Stigler, *supra* note 61 at 67; *accord HCA*, 106 F.T.C. at 491; *Weyerhaeuser Co.*, 106 F.T.C. at 286. In the rest of this opinion, the term "barriers to entry" is intended to refer to "Stiglerian" barriers to entry.

[66] *Echlin Manufacturing Co.*, 105 F.T.C. at 485–86.

[67] For example, in *HCA* the Commission noted that both Georgia and Tennessee required prospective or incumbent hospitals to secure "certificates of need" from their respective States before, *inter alia*, establishing new acute care hospitals, expanding the bed capacity of existing hospitals, changing the services they offered, or making significant capital expenditures. *HCA*, 106 F.T.C. at 489–91. Securing these certificates required following elaborate, time-consuming procedures, and the Commission concluded that these procedures represented a classic barrier to entry. *Id.* at 491.

[68] *Weyerhaeuser Co.*, 106 F.T.C. at 287.

determined that the relevant costs for comparison purposes are the "economic costs measured at the time of entry;" that is, the costs that each firm—whether an incumbent or a prospective entrant—confronts at the time of its entry effort.[69]

Impediments to entry that do not rise to the level of absolute barriers to entry may nevertheless permit the exercise of market power for substantial periods of time. The Commission has defined impediments to entry as

> any condition that necessarily delays entry into a market for a significant period of time and thus allows market power to be exercised in the interim.[70]

The Commission has more recently indicated that when new entry is possible only through the construction of a plant that cannot be completed in less than four to four and one half years, that constitutes an impediment to entry.[71] The nature of sales contracts within an industry helps to determine the significance of the delay arising from impediments to entry. If most prices are fixed pursuant to contracts with terms longer than the delay occasioned by impediments to entry, then the impediments may have no competitive significance.

As the time and expenditures needed to overcome barriers and impediments to entry increase, the likelihood that a given acquisition will have anticompetitive effects, *ceteris paribus*, increases as well. In this case, both the PVC and the VCM markets are characterized by substantial barriers and impediments to entry, and fringe firms are unlikely to constrain collusive conduct in either market.

1. *PVC Market*

Under current conditions, four or five years would be required to plan and construct a new bulk or suspension PVC plant, or to expand an existing plant,[72] including one to two years for required environmental permits; [73] at least six months for pre-permit engineering; [74] and two years for actual construction. IDF 65–67; Schaefer, Tr. 1133. Additional time—up to one year—may be needed for prospective entrants to evaluate and secure the technology licenses needed to begin PVC production.[75] Because these factors necessarily delay entry into the PVC market for a substantial period of time, they constitute a substantial impediment to entry. Moreover, because some of the environmental regulations were adopted recently—and have significantly increased the length of time required to enter the PVC market—they constitute a significant barrier to entry.

The environmental restrictions constrain both new entry and expansion by incumbent firms. Air emissions from PVC and VCM plants are subject to a number of air quality restrictions created pursuant to the Clean Air Act, 42 U.S.C. 7401–7642, including specific standards covering vinyl chloride emissions.[76] Therefore, preconstruction permits must be obtained for all new PVC plants, and for major expansions of existing plants, certifying that they will comply with a variety of "Prevention of Serious Deterioration" ("PSD") regulations.[77] The PSD regulations are relatively restrictive in areas that currently meet federal air quality standards—requiring, *inter alia*, preconstruction permits[78]—and even more restrictive in areas that do not currently meet those standards.[79]

Moreover, in 1980 EPA amended its PSD regulations to require the presentation of continuous air monitoring data *prior* to the processing of a permit application. Diamond estimated that this requirement:

> could add up to one year to the time it takes to get a construction permit. This means it will take from one to two years to get a PSD Permit before construction can begin.

CX 446D. Tenneco similarly estimated that one year of ambient air quality monitoring would probably be required before the submission of a preconstruction permit application. CX 574J.

In addition, effluent discharges from VCM and PVC resin plants are subject to the restrictions of the Clean Water Act, as amended by the Federal Water Pollution Control Act, 33 U.S.C. 1251–1376. The EPA has specifically designated vinyl chloride as a toxic pollutant, 33 U.S.C. 1317; 40 CFR 401.15, and PVC plants as pollutant discharge point sources.[80] As a result, new and existing PVC manufacturing facilities must comply with the permit requirements of the National Pollutant Discharge Elimination System. 33 U.S.C. 1342. PVC plants may also be subject to a variety of local regulations such as land use restrictions. IDF 66; ID at 18 n.13.

These requirements have significantly lengthened the lead time and increased the risk associated with new plant construction and plant expansion since 1976. In one internal document, Goodrich noted:

> Complicating the development and implementation of new processes is the long lead time required for plant expansions and constructing grass root PVC plants. *This is now four to five years vs. the three years formerly required* due to the increasing number of local and federal restrictions and necessary approvals. The result is R&D's time table to freeze a plant design is drastically shortened . . . By-passing stages in process development to meet the shorter time tables will significantly increase the risks of long costly plant start-ups and not meeting planned capacity goals.[81]

Recent plant construction efforts confirm these assessments. For example, Formosa—which already had access to the production technology it needed—began a new PVC/VCM plant construction effort in the latter part of 1978, and was not able to start operating

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[69] *Echlin Manufacturing Co.*, 105 F.T.C. at 486. The fact that an incumbent firm confronts lower costs than a prospective entrant at the time the latter firm attempts to enter is not necessarily relevant. The incumbent's lower current costs may simply represent compensation for the risks it overcame when it entered. *Id.*

[70] *Id.* at 486; *accord Weyerhaeuser Co.*, 106 F.T.C. at 286–87. The economic literature on "strategic entry deterrence" suggests that practices that fall within this characterization may also impede entry. *See generally* Salop, *Strategic Entry Deterrence*, 79 Am. Econ. Rev. 335 (Papers and Proceedings) (1979).

[71] *Weyerhaeuser Co.*, 106 F.T.C. at 287. The Commission found that greenfield entry would require four to four-and-one-half years per plant from beginning to end, including the time required for plant development, site selection, design work, applications for environmental permits, and actual construction. *Id.* Nine recent plant expansions in the relevant market indicated, however, that "existing facilities [could] be upgraded fairly easily, and at relatively low cost." *Id.* at 287–88. The Commission therefore concluded that the consequent "possibility of expanded output by fringe firms" limited "the possibility of anticompetitive behavior." *Id.* at 289. In this case, by contrast, barriers and impediments to both greenfield entry and incumbent plant expansion are high.

[72] IDF 64; CX 15A; CX 16B–Z10 *in camera*; CX 196A *in camera*; CX 439B; CX 446C; *see* Disch, Tr. 653 (3–4 years).

[73] Schaefer, Tr. 1133; CX 38V *in camera*; CX 506B, 592 *in camera*; IDF 66.

[74] DiLiddo, Tr. 3337; IDF 67.

[75] Disch, Tr. 645–47; Schaefer, Tr. 1133; IDF 69.

[76] *National Emissions Standard for Vinyl Chloride*, 40 CFR 61.60–61.68, promulgated pursuant to the *National Emission Standard for Hazardous Air Pollutants*, 42 U.S.C. 7412. Vinyl chloride has been specifically designated as an environmental pollutant; as a result, in 1976 the Environmental Protection Agency promulgated a standard to reduce atmospheric VCM emissions. In 1975, the Occupational Health and Safety Administration determined that VCM is a highly specific cause of liver cancer, and therefore promulgated a standard to reduce worker exposure to residual VCM. Disch, Tr. 649; Kienholz, Tr. 755.

[77] *Prevention of Significant Deterioration*, 40 CFR 51.24(b)(23), 52.21(b)(23).

[78] 42 U.S.C. 7407, 7475; 40 CFR 51.24, 52.21.

[79] 42 U.S.C. 7501–7508; 40 CFR 52.24.

[80] 33 U.S.C. 1316(B)(1)(A); *see* 40 CFR 401.12, 416.10–416.15.

[81] CX 196A *in camera* (emphasis added); *accord* CX 14F *in camera* ("Building permits are being delayed by government regulations, causing longer lead times and/or higher RISKS to build new plants.").

the new facility until December, 1982. IDF 70; ID at 20 n. 15. When Goodrich began its never-completed Convent, Louisiana suspension PVC plant project in July 1979, it had already spent eight months conducting an extensive PVC/VCM strategy and site selection study, and did not expect to bring the plant onstream until the third quarter of 1983. IDF 71. Similarly, in 1981 Diamond projected the lead time for a new suspension PVC plant at Deer Park, using its own technology, to be four to five years "from concept to startup." IDF 72.

In short, newly adopted environmental restrictions may be characterized as a barrier to entry into the PVC market. They substantially slow both the construction of new capacity and the expansion of existing capacity, and represent a new cost that incumbent firms did not have to bear. Some expansion of existing facilities by large incumbent firms has occurred since 1970. However, expansion usually constrains the pricing discretion of incumbent firms only if it is undertaken by a fringe firm that is not likely to be a party to a collusive arrangement.[82] The number of firms that may be characterized as "fringe" PVC producers has been declining steadily. As Tables I and II indicate, in addition to Diamond Shamrock, three fringe firms—Stauffer Chemical, Talleyrand Chemicals, and Great American Chemical—left the PVC market between 1981 and 1983.

Goodrich and other incumbent firms have on a number of occasions recognized that entry into the PVC market is difficult. In one internal assessment, Goodrich concluded that "[r]elatively high barriers to entry should prevent a large number [of] expansions or new entries." [83] Actual entry experience supports this view; no *de novo* entry has occurred since 1975.[84] Mr. Disch of Tenneco testified that he did not expect any new entrants into the PVC market over the next three or four years.[85]

Of course, PVC imports are not constrained by domestic environmental restrictions, and they have increased to some degree over the last few years. In 1977, imports represented only 0.6 percent of U.S. bulk and suspension PVC consumption; in 1984 they accounted for approximately 4 percent of that total.[86] Much of the increase in imports, however, appears to be attributable to extraordinary events affecting domestic PVC supply and currency exchange rates. The dollar increased in value by 66 percent between the third quarter of 1980 and the third quarter of 1984,[87] producing, *ceteris paribus*, a 66 percent increase in domestic PVC prices, in comparison with foreign PVC prices. Even if these exchange fluctuation effects are not considered, domestic prices increased considerably more during the last part of that period than the 5 percent increase that is usually applied to define the relevant market, because freezing weather conditions during the 1983–1984 winter forced several domestic PVC plants to shut down.[88] Thus, imports are a small proportion of domestic PVC consumption and, absent extraordinary conditions, do not appear to constrain domestic prices.

In addition, PVC imports manufactured by domestic producers in other countries are unlikely to constrain collusion among those same domestic producers. Canada and Mexico are the principal sources of PVC imports.[89] Goodrich is the largest PVC producer in Canada,[90] and is a major PVC producer in Mexico.[91] Furthermore, PVC imports from overseas countries must be transported over water in bags, rather than in rail tank cars, at a cost disadvantage—relative to North America PVC—of three to seven cents per pound. H. Wheeler, Tr. 1776–77. This is a substantial disadvantage; three cents per pound represents 9 to 18 percent of the average selling price of "general purpose PVC resin"—17 cents to 35 cents per pound—during the 1981–1983 period. *See* note 179 *infra*. For all of these reasons, we conclude that PVC imports do not significantly constrain domestic pricing discretion.

2. VCM Market

The VCM market is also characterized by a substantial barrier and impediment to entry created by plant construction requirements, and an impediment to entry created by minimum scale requirements. First, substantial lead time—from four to five years—is required to construct a new VCM plant, or to expand an existing plant, including six months to perform required preliminary engineering work; one to two years to secure needed environmental permits (the same ones noted in the PVC discussion, *supra*); six months to evaluate and secure needed VCM manufacturing technology; and one to two years for actual construction. IDF 272–277 *in camera;* Kienholz, Tr. 803–05. For example, as detailed *supra*, it took Formosa—which already had the requisite manufacturing technology in hand—about four and one-half years to construct its PVC/VCM complex. IDF 278. Similarly, Goodrich expected its proposed VCM plant in Louisiana to require approximately four years for construction. IDF 279 *in camera*. Incumbent firms confronted shorter timetables than prospective new entrants would confront now. As noted *supra*, in 1980 the Environmental Protection Agency amended its regulations to require air quality monitoring *prior* to filing permit applications. Diamond and Tenneco documents indicate that this additional requirement would add at least one year to the time needed to construct new plants, or to add capacity to existing plants where continuous air monitoring is not already in effect.[92]

Second, substantial minimum efficient scale requirements are likely to impede entry into the VCM market. If a new entrant must achieve a sales level that is

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[82] Weyerhaeuser Co., 106 F.T.C. at 287–88 and n. 69.

[83] CX 199Z76; *accord* CX 199Z82; CX 248E *in camera*.

[84] Kaserman, Tr. 2341–44; CS 664G, W *in camera*. Respondents argue that Formosa entered in 1974, "exited and then reentered in 1981" (RAB at 53), but Formosa's efforts are more akin to an expansion than to *de novo* entry.

[85] Disch, Tr. 692–93. At least two other factors may impede efforts to enter the PVC market to some degree. First, an entry effort at minimum efficient scale would apparently require at least 300 million pounds of annual production capacity, at a cost of $100 million. IDF 60; Schaefer, Tr. 1211–12; Diamond Admission 450 (CX 6S). In 1981 that represented 5.8 percent of total PVC production in the United States. *See* Table I, *infra*. It would be difficult to secure that percentage of total market sales without provoking a price response from incumbent firms. *See* Salop, *Measuring Ease of Entry*, 31 Antitrust Bulletin 551 (1986).

Second, sunk costs may represent an impediment to new entry. IDF 63; *see* IDF 73–75. PVC plants are suitable only for manufacturing PVC, and investing in such a plant therefore entails the risk of losing the entire investment. One might ordinarily conclude that incumbent firms faced precisely the same risks when they entered the PVC industry. However, Goodrich believed that its "preemptive strategy" heightened the risks associated with expansion or new entry into the PVC market. *See* CX 47B; CX 59D *in camera; see generally* Salop, *supra* note 70.

[86] RAB at 33 (240 million pounds is 4 percent of estimated domestic consumption of 5.635 billion pounds (*see* Table II, *infra*) in 1983).

[87] *Compare* CX 776E *with* CX 777E. The value of the dollar against other currencies—as measured by the Federal Reserve Board's index of weighted average exchange value—has more recently declined, producing the opposite effect, and making import prices less attractive relative to domestic prices.

[88] Kaserman, Tr. 2249–50; L. Wheeler, Tr. 986–89; DiLiddo, Tr. 3380–81; H. Wheeler, Tr. 1775–76.

[89] Kaserman, Tr. 2248; Taylor, Tr. 1687.

[90] Kaserman, Tr. 2248; CX 299 O–P *in camera;* RX 190D; *see* CX 92K.

[91] Kaserman, Tr. 2249; CX 299 O–P *in camera; see* CX 92K.

[92] CX 446D; CX 574J; CRB at 40–41 n. 53; *see also* Kienholz, Tr. 803–04.

a substantial percentage of total industry output—in order to avoid suffering a significant cost disadvantage relative to other firms—its entry will increase industry supply significantly. If demand does not increase to the same degree, prices are likely to fall, because incumbent firms are more likely to lower prices than to surrender market share. Faced with the prospect of either a substantial cost disadvantage or nonrenumerative prices, a prospective entrant is not likely to enter.

The minimum efficient scale for a VCM plant is generally considered to be 800 million to 1 billion pounds in annual production capacity.[93] When it built its billion pound VCM plant in the 1970's, Diamond "considered it essential to build a plant with a production capacity of one billion pounds of VCM per year" (CX 424B; *accord* CX 445), and estimated that plants ⅔ and ⅓ as large would respectively suffer cost disadvantages of 0.6 cents and 1.8 cents per pound. CX 445. A Georgia-Pacific plant completed in 1980 similarly has a production capacity of 1 billion pounds. The plant that Formosa completed in 1982 has a capacity of 529 million pounds, but it was sized to match an existing PVC plant on the site, and Formosa was willing to sacrifice some efficiency in order to avoid the costs associated with marketing surplus VCM.[94]

In 1981, prior to the acquisition, 6.856 billion pounds of VCM were produced in the United States. Minimum efficient plant scale (eight hundred million pounds) therefore represented about 11.7 percent of total United States VCM production in that year.[95] It is unlikely that a new entrant could secure that level of sales without provoking a substantial response from incumbent firms, thereby driving prices to lower levels. Indeed, one industry document indicated that VCM "capacity additions [are] disruptive to entire industry because efficient plant size is 1 billion pounds (10% of total U.S. industry size)." RX 90Z62 *in camera; accord,* L. Wheeler, Tr. 991. One witness—a Goodrich employee—testified that a new entrant with a new plant would need to "cut prices very substantially and over a long period of time." [96]

The foregoing analysis establishes that environmental restrictions adopted in 1980 represent a significant barrier to entry into the VCM market, and that the four to five years currently required to construct a new plant or expand an existing plant constitute a substantial impediment to entry. It also establishes that minimum efficient scale—in conjunction with sunk cost effects—represents a substantial impediment to entry into the VCM market. Actual entry experience supports the conclusion that entry into the VCM market would be difficult.[97] It took Formosa four and one-half years to complete its VCM plant, and Goodrich similarly expected its proposed VCM plant to require four years of construction. *See* page 39, *supra.* Imports are not likely to constrain domestic producer pricing discretion. They accounted for only 1.6 percent of the total VCM production of domestic firms in 1981, and only 1.8 percent in 1983. CX 663E *in camera.*

B. Concentration Levels

As the number of firms in an industry declines, and industry concentration increases, *ceteris paribus,* it becomes easier for those firms to coordinate their pricing, and the likelihood of anticompetitive effects from an acquisition consequently increases as well.[98] Conversely, as the *DOJ Guidelines* indicate:

> Other things being equal, [market] concentration affects the likelihood that one firm, or a small group of firms, could successfully exercise market power * * *. As the number of firms necessary to control a given percentage of total supply increases, the difficulties and costs of reaching and enforcing consensus with respect to the control of that supply also increase.[99]

Consistent with this view, in *United States v. Philadelphia National Bank* the Supreme Court indicated that a crucial initial question in merger cases is whether the merger or acquisition at issue

> Produces a firm controlling an undue percentage share of the relevant market, and results in a significant increase in the concentration of firms in that market, [such that] it is * * * inherently likely to lessen competition substantially * * *.[100]

The Court determined that the acquisition at issue was presumptively illegal because it would have created a bank that controlled 36 percent of the relevant market; increased two-firm concentration ("C_2") form 44 percent to 59 percent; and increased four-firm concentration ("C_4") to 78 percent. The Court observed that the presumption illegality could be rebutted by "evidence clearly showing that the merger is not likely to have such anticompetitive effects." [101] Subsequently, in *United States* v. *General Dynamics Corp.*, the Court determined that premerger four-firm concentration ratios of 43 percent and 54.5 percent in two separate relevant markets, coupled with 4.8 percentage point and 8.1 percentage

[93] IDF 268 *in camera:* Kaserman, Tr. 2472–73; L. Wheeler, Tr. 928; DiLiddo, Tr. 3290; Taylor, Tr. 2563; *but see* Disch, Tr. 858–859 (350 million to 500 million pounds). In 1981, Goodrich concluded that a "world scale" plant would have a capacity of one billion pounds. CX 44A *in camera.*

[94] Goodrich believed that Formosa might later expand that facility to bring it up to "world scale." RX 153T *in camera.*

[95] *See* Table IV, *infra.* By comparison, minimum efficient scale for PVC plants is considerably lower, representing less than 6 percent of PVC production. *See* note 85, *supra*

[96] DiLiddo, Tr. 3255–56. Demand growth is not likely to make entry on this scale more feasible. Industry members expect demand for VCM to grow at an annual rate of no more than 3 to 4 percent, approximating the rate of growth of the gross national product. IDF 315–16 *in camera;* Kienholz, Tr. 792. Moreover, incumbent firms already possess some excess capacity that could be devoted to accommodating demand growth.

The entry-deterring effects of the minimum efficient scale requirements are accentuated by the fact that VCM plants are highly specialized, with no application other than VCM production. IDF 270. Thus, an investment in an unsuccessful entry effort at minimum efficient scale will be completely lost, or "sunk." *See* IDF 270, 271, 280, 281. Both the Commission and the Department of Justice have recognized that entry efforts requiring the investment of substantial sunk costs are less likely to occur. *B.A.T. Industries, Ltd.,* 104 F.T.C. 852, 935 (1984); *DOJ Guidelines* at ¶ 3.3 n.21.

[97] Kaserman, Tr. 2480–85. Respondents argue that some currently mothballed capacity could be brought back into production in response to supracompetitive prices. For example, Shell mothballed its Norco, Louisiana VCM plant in 1982 because of the decline in demand during the 1981–1982 period. RX 428A *in camera;* RX 822A; L. Wheeler, Tr. 1040–42 *in camera.* Corrosion is a problem with respect to such plants, but if properly maintained they can be brought back into production within six months to a year. Rawson, Oral Argument at 49. However, if a plant is simply mothballed, it will become very expensive to restart within two years. Moreover, even if it is constantly inspected, and deteriorating components are immediately repaired, at substantial expense, corrosion will render it inoperable within four to six years. Kienholz, Tr. 783–84.

In any event, restarting mothballed capacity will usually constrain the pricing discretion of incumbent firms only if undertaken by a fringe firm that is not likely to be a party to a collusive arrangement. *Weyerhaeuser Co.,* 106 F.T.C. at 287–88 and n. 69. As the sixth largest VCM producer, controlling almost 9 percent of VCM practical production capacity, (*see* Table V), Shell cannot be characterized as a fringe firm.

[98] *HCA v. FTC,* 807 F.2d at 1387; *accord HCA,* 106 F.T.C. at 488–489; Scherer, *supra* note 61 at 199–200; *see also* Posner *supra* note 58 at 52–56; Stigler, *A Theory of Oligopoly,* 72 J. Pol. Econ. 44 (1964).

[99] *DOJ Guidelines* at ¶ 3.1. Several factors support this conclusion. For example, inevitable differences in cost functions—and hence in price preferences—may become more pronounced as the number of firms increases. In this situation, each firm will prefer the level of output and prices that maximizes its own profits, and the difficulty of reaching and sustaining a consensus strategy will increase. *See generally* Scherer, *supra* note 61, at 156–60; Hay, *supra* note 58, at 447; G. Stigler, *The Theory of Price* 233–34 (3d ed. 1966).

[100] *United States v. Philadelphia National Bank,* 374 U.S. 321, 363 (1963); *accord, e.g., Weyerhaeuser Co.,* 106 F.T.C. at 278.

[101] *United States* v. *Philadelphia National Bank,* 374 U.S. at 331, 363–66.

point increases in the acquiring firm's shares in those markets, were sufficient to establish a *prima facie* violation.[102]

The Commission has in the past taken the position that "four-firm market shares ["C_4"] in the range of 50 percent are sufficient to raise concern over the loss of potential competition," and therefore create a rebuttable presumption that the acquisition at issue is likely to have anticompetitive effects.[103] However, the Commission has also determined that the Herfindahl-Hirschman Index ("HHI") provides a better measure of the structural character of a relevant market than concentration ratios.[104] Its principal advantage is that it reflects not only the combined share of the largest firms, but also their shares relative to one another and to all other firms in the industry,[105] and thus provides "a useful tool in interpreting market structure evidence".[106] The Justice Department has taken the same position, and has noted that—according to an empirical study it conducted—HHIs of 1000 and 1800 correspond roughly to four-firm concentration ratios of 50 percent and 70 percent respectively.[107] A number of federal courts have also recently determned that the HHI provides a useful measure of concentration levels.[108]

Finding a *prima facie* violation of section 7 creates a rebuttable presumption of anticompetitive effects and shifts the burden of going forward with evidence to the respondent.[109] The Commission has noted, however, that—

> the analytical soundness of this evidentiary presumption is obviously weaker in cases in which C_4 falls in the 50 percent range (or HHI falls below 1000, for example) than in cases in which C_3 or C_4 exceeds 90 percent (or HHI exceeds, for example, 2500) * * * [T]he Commission will require less evidence to overcome this presumption when only moderate concentration—C_4 levels between 50–70 percent and HHI between 1000 and 1800—is found * * *[110]

More recently, the Commission has reaffirmed that although market share evidence is "an important starting point in merger analysis, it alone is not conclusive in determining the legality of a merger under section 7."[111]

Weyerhaeuser and *HCA* represent the Commission's most recent applications of section 7. In *Weyerhaeuser*, as a result of the challenged acquisition, the respondent had become the largest firm in the relevant market, with a 20.64 percent share that was seven percentage points higher than the share of the second-largest firm. Moreover, the acquisition had increased the market HHI for actual production by 211 points, from 955 to 1166, and had increased four-firm concentration from 48.4 percent to 57.8 percent. The Commission determined that these data were sufficient to "suggest a *prima facie* violation."[112] However, the Commission observed that the acquisition fell within the lower end of the mid-range of the Department of Justice Merger Guidelines, and calls for especially careful review of a number of industry characteristics in addition to concentration in order meaningfully to assess the acquisition's effect on competition.[113]

Its analysis of these other factors led the Commission to conclude that the acquisition did not violate section 7 of the Clayton Act.[114]

In *HCA*, by contrast, the Commission considered a market with an HHI of 1900 before the acquisitions at issue that increased to over 2400 after the acquisitions; as a result, four-firm concentration increased to 92 percent. Moreover, HCA's market share increased from 14 percent to 26 percent. The Commission found these figures supported "an inference of harm to competition," *ceteris paribus*, and characterized the increase in concentration "in an already concentrated market to be of serious competitive concern."[115]

1. PVC Market

In 1981, prior to the acquisition, approximately 5.242 billion pounds of bulk and suspension PVC were produced in the United States.[116] In 1983, after the acquisition had been completed, approximately 5.635 billion pounds were produced domestically.[117] The record includes three separate measures of concentration levels in the PVC market: nameplate (or "design") capacity, practical production capacity, and actual production levels.[118] Prior to the acquisition, Goodrich ranked first in all three measures, while Diamond ranked sixth in nameplate capacity,

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[102] *United States* v. *General Dynamics Corp.*, 415 U.S. 486, 494–96 (1974); *accord, e.g., FTC* v. *Warner Communications, Inc.*, 742 F. 2d 1156, 1163–64 (9th Cir. 1984) (*per curiam*); *Marathon Oil Co.* v. *Mobil Corp.*, 669 F. 2d 378, 383 (6th Cir. 1981), *cert. denied*, 455 U.S. 982 (1982); *Grumman Corp.* v. *LTV Corp.*, 665 F. 2d 10, 12–15 (2d Cir. 1981); *RSR Corp.* v. *FTC*, 602 F. 2d 1317, 1324–25 (9th Cir. 1979), *cert. denied*, 445 U.S. 927 (1980); *FTC* v. *Bass Bros. Enters., Inc.*, 1984–1 Trade Cas. (CCH) ¶66,041, at 68,609–11 (N.D. Ohio 1984).

[103] *Grand Union Co.*, 102 F.T.C. at 1054, *quoting Tenneco, Inc.*, 98 F.T.C. 464, 585–85 (1981), *rev'd on other grounds*, 689 F. 2d 346, 352 (2d Cir. 1982).

[104] *Grand Union Co.*, 102 F.T.C., at 1053–54. The Commission has thereby rejected its earlier contrary holding in *Litton Industries*, 82 F.T.C. 793, 904–7, 1010–11 and nn. 33–35 (1973). The HHI is calculated by summing the squares of the individual market shares of all the firms in the market. *HCA*, 106 F.T.C. at 488.

[105] *HCA*, 106 F.T.C. at 488; *Grand Union Co.*, 102 F.T.C. at 1053–54.

[106] *HCA*, 106 F.T.C. at 488; *see* also Stigler, *supra* note 98 at 55. It also provides a basis for estimating the degree to which a small number of firms could assess supracompetitive prices without expressly cooperating with one another. Cowling & Waterson, *Price-Cost Margins and Market Structure*, 43 Economics 267 (1970); Ordover, Sykes & Willig, *Herfindahl Concentration, Rivalry, and Mergers*, 95 Harv. L. Rev. 1857, 1865 (1982).

[107] *DOJ Guidelines* at ¶3.1. However, the presence of a single very large firm will substantially increase the HHI for a given industry, *ceteris paribus*. *See, e.g.*, American Bar Association, *Antitrust Law Developments* 161 n. 115 (2d ed. 1984).

[108] *Tenneco, Inc.* v. *Federal Trade Commission*, 689 F. 2d 346, 359 (2d Cir. 1982) (Mansfield, J., dissenting); *Christian Schmidt Brewing Co.* v. *G. Heileman Brewing Co.*, 600 F. Supp. 1326, 1329–30 n. 3 (E.D. Mich.), *aff'd*, 753 F. 2d 1354 (6th Cir.), *cert. dismissed*, 105 S. Ct. 1155 (1985); *United States* v. *G. Heileman Brewing Co.*, 563 F. Supp. 643, 644 n. 3 (D. Del. 1983); *Vial* v. *First Commerce Corp.*, 1983 Trade Cas. (CCH) 65,692 (E.D. La. 1983); *Marthon Oil Co.* v. *Mobil Corp.*, 530 F. Supp. 315, 323 n. 15 (N.D. Ohio), *aff'd*, 669 F. 2d 378 (6th Cir. 1981), *cert. denied*, 455 U.S. 982 (1982) (not used, however). *But see United States* v. *Black & Decker Mfg. Co.*, 430 F. Supp. 729, 748 n. 38 (D. Md. 1976).

[109] *United States* v. *Citizens & Southern National Bank*, 422 U.S. 86, 120 (1975); *Kaiser Aluminum & Chemical Corp.*, v. *FTC*, 632 F. 2d 1324, 1340 and n. 12 (7th Cir. 1981); *Weyerhaeuser Co.*, 106 F.T.C. at 280 n. 50.

[110] *Grand Union Co.*, 102 F.T.C. at 1055; *see FTC Statement*, ¶4516 at 6901–4. The *DOJ Guidelines* similarly characterize markets with HHI levels between 1000 and 1800 as moderately concentrated, and indicate that the Department of Justice will ordinarily challenge mergers in such markets that increase HHI levels by more than 100 points. *DOJ Guidelines* at ¶3.11. However, the presumption of anticompetitive effects arising from an acquisition that produces an HHI within the 1000–1800 range can be rebutted by evidence concerning any of a variety of other structural factors. *DOJ Guidelines* at ¶3.11(c).

[111] *AMI*, 104 F.T.C. at 200; *accord Weyerhaeuser Co.*, 106 F.T.C. at 278; *see also HCA*, 106 F.T.C. at 474.

[112] *Weyerhaeuser*, 106 F.T.C. at 280.

[113] *Id.*

[114] *Id.*

[115] *HCA*, 106 F.T.C. at 488.

[116] *See* Table I, *infra*.

[117] *See* Table II, *infra*.

[118] A plant's nameplate capacity is the level of capacity that it is designed to achieve, while its practical production capacity is its effective production capacity. CPF 5.22 *in camera*. Practical production capacity thus provides a better measure of actual production constraints. Actual production levels may occasionally exceed capacity estimates if, for example, a firm chooses to reduce inventory levels or produce at a point where marginal cost is very high.

The Justice Department has taken the position that if the relevant product is branded or relatively differentiated, dollar sales provide a better measure of concentration levels. By contrast, if the relevant product is relatively homogeneous, physical capacity may provide a better measure. *DOJ Guidelines* at ¶ 2.4. In this case, VCM is homogeneous, while PVC is more heterogeneous. As a result, two capacity measures and an actual production (in pounds rather than dollars) measure of concentration have been used.

fourth in practical production capacity, and fifth in actual production. IDF 34–35. The following tables depict the market shares and ranks of the eighteen firms in the United States bulk and suspension PVC market—for each of the three concentration measures—prior to the acquisition, and the same data for the fourteen firms still in the industry as of January 1984.

TABLE I.—BULK AND SUSPENSION PVC MARKET SHARES BEFORE THE ACQUISITION (PERCENTAGES) (UNITED STATES) [119]

Firm	Nameplate capacity (Jan. 1982)	Practicial production capacity (Jan. 1982)	Actual production (1981)
Goodrich	18.51 (1st)	17.79 (1st)	16.1 (1st).
Tenneco Polymers	12.35 (2nd)	11.72 (2nd)	12.9 (2nd).
Georgia Pacific	9.94 (3rd)	8.96 (5th)	7.8 (6th).
Shintech	9.37 (4th)	10.75 (3rd)	10.5 (3rd).
Occidental Chemical	8.60 (5th)	8.30 (7th)	7.0 (7th).
Diamond Shamrock:			
Deer Park Plant #5	3.98	4.28	
Deer Park Plants #1–4X	3.08	3.21	
Delaware City Plant	1.28	1.49	
Total	8.33 (6th)	8.99 (4th)	8.3 (5th).
Conoco	8.31 (7th)	8.73 (6th)	8.6 (4th).
Borden	6.25 (8th)	6.27 (8th)	6.8 (8th).
Air Products and Chemicals	5.11 (9th)	4.63 (9th)	5.7 (9th).
CertainTeed	2.66 (10th)	3.28 (10th)	4.3 (10th).
Formosa Plastics	2.56 (11th)	2.93 (11th)	1.9 (14th).
Stauffer Chemical	1.99 (12th)	1.79 (12th)	3.0 (11th).
GenCorp	1.90 (13th)	1.78 (14th)	2.6 (12th).
Ethyl	1.70 (14th)	1.79 (12th)	2.0 (13th).
Great American Chemical Corp	0.99 (15th)	0.90 (15th)	0.3 (17th).
Keysor-Century Corp	0.71 (16th)	0.75 (16th)	0.3 (17th).
Pantasote	0.71 (16th)	0.67 (17th)	1.4 (15th).
Talleyrand Chemicals			0.6 (16th).
Total	7.043 billion pounds	6.700 billion pounds	5.242 billion pounds.

[119] CX 662D–G *in camera*; CX 664–O–V *in camera*; IDF 34–38 *in camera*.

TABLE II.—BULK AND SUSPENSION PVC MARKET SHARES AFTER THE ACQUISITION (PERCENTAGES) (UNITED STATES) [120]

Firm	Nameplate capacity (Jan. 1984)	Practical production capacity (Jan. 1984)	Actual production (1983)
Goodrich	20.6 (1st)	19.4 (1st)	18.4 (1st).
Tenneco Polymers	12.0 (2nd)	11.4 (2nd)	11.8 (3rd).
Georgia Pacific	11.0 (3rd)	10.3 (6th)	8.4 (6th).
Formosa Plastics	10.5 (4th)	11.0 (3rd)	10.2 (5th).
Borden	10.2 (5th)	10.1 (7th)	7.7 (7th).
Conoco	9.9 (6th)	10.4 (4th)	11.0 (4th).
Shintech	9.1 (7th)	10.4 (4th)	12.7 (2nd).
Occidental Chemical	6.2 (8th)	6.1 (8th)	5.6 (8th).
Air Products and Chemicals	5.0 (9th)	4.8 (9th)	3.6 (10th).
CertainTeed	2.6 (10th)	3.2 (10th)	4.0 (9th).
GenCorp	1.7 (11th)	1.6 (11th)	1.7 (12th).
Keysor-Century Corp	0.7 (12th)	0.7 (12th)	0.7 (13th).
Pantasote	0.7 (12th)	0.7 (12th)	0.1 (14th).
Ethyl	0.0	0.0	2.1 (11th).
Total	7.251 billion pounds	6.901 billion pounds	5.635 billion pounds.

[120] CX 664A–V *in camera*; IDF 34–38 *in camera*.

The acquisition generated increases in all three concentration measures. First, it increased the HHI for nameplate capacity by approximately 113 points, to 1098 after the acquisition. IDF 49. After Diamond closed its remaining Deer Park Plants, the HHI for nameplate capacity increased by another 53 points to 1151.[121] By 1985, the HHI for nameplate capacity had increased by an additional 52 points to 1203.[122]

Second, the acquisition increased the HHI for practical production capacity by 112 points, from 967 to 1079. IDF 49. After Diamond closed its Deer Park plants, the HHI increased to 1130.[123] After Diamond closed or sold its remaining plants, the HHI increased by an additional 132 points to 1211.[124] Third and finally, the acquisition—coupled with Diamond's closure of its remaining PVC plants—increased the HHI for actual production by 221 points, from 910 to 1131. The acquisition alone

[121] CPF 5.27 *in camera*. This calculation is based upon treating the Delaware City facility as an independent entity.

[122] IDF 54. The use of post-acquisition structural evidence as a basis for evaluating the likelihood of anticompetitive effects from a merger or acquisition is well-established, as respondents recognize. *See* Rawson, Oral Argument at 46. The use of post-acquisition performance evidence is discussed in Part V, *infra*.

[123] CPF 5.28 *in camera*. This calculation is similarly based upon treating the Delaware City facility as a separate entity.

[124] CPF 5.28 *in camera*.

probably increased the HHI for actual production by approximately 110 points, to approximately 1020.[125]

If the later closing of Diamond's other Deer Park plants is not attributed to the acquisition, it increased Goodrich's share of nameplate PVC capacity from 18.5 percent to 22.5 percent, and its share of practical production capacity from 17.8 percent to 22.1 percent. IDF 52 *in camera*; *see* Table I, *supra*. Under the more traditional rubric of earlier cases, the acquisition increased four-firm concentration from 50.2 percent to 54.2 percent in nameplate capacity; from 49.3 percent to 53.6 percent in practical production capacity; and from 48.1 percent to over 50 percent (estimated) in actual production. *See* Table I, *supra*. The following table illustrates contemporaneous industrywide changes in both HHI levels and four-firm concentration levels:[126]

[125] IDF 53 *in camera*, *citing* CX 661Z-16 *in camera*. The record does not provide an explicit basis for assessing the effect of the acquisition of Deer Park plant number 5 alone upon the HHI for actual production levels because it does not indicate the share of actual production for which plant number 5 accounted. Kaserman, Tr. 2271. However, as Table I indicates, Deer Park Plant number 5 accounted for approximately one-half of Diamond's nameplate and practical PVC production capacities. The HHI increase in actual production actually attributable to the Goodrich acquisition is therefore probably only half of the 221 figure—assuming that plant number 5 also accounted for one-half of Diamond's actual production—or approximately 110.

[126] The concentration data in Table III differ to some degree from the data cited in the text because of other events in the industry. Because the acquisition occurred in January 1982, the 1983 capacity data and the 1982 production data, denoted by asterisks, are the first to reflect the effects of the acquisition.

TABLE III.—CHANGES IN BULK AND SUSPENSION PVC HHI AND FOUR-FIRM CONCENTRATION 1980–1985

Concentration measure	1980	1981	1982	1983	1984	1985
Nameplate capacity [127]	897	928	985	* 1088	1156	1203
	(49.2)	(48.3)	(50.2)	(53.3)	(54.1)	(56.1)
Practical production capacity [128]	871	940	967	* 1058	1126	
	(47.2)	(48.2)	(49.2)	(52.9)	(52.2)	
Actual production [129]	851	910	* 1131	1065		
	(45.6)	(48.1)	(58.1)	(53.8)		

[127] CX 664F-G *in camera*. The 1985 HHI for nameplate capacity is based on January 1985 capacity estimates, which were derived in turn by adjusting January 1984 capacity to reflect Shintech's expansion of its suspension PVC plant to 1 billion pounds of capacity during 1984; GenCorp's discontinuance of its PVC business in September 1984; and Pantasote's discontinuance of its PVC business in the fourth quarter of 1984. CPF 5.69 *in camera*.

[128] CX 664M-N *in camera*.

[129] CX 664V *in camera*.

As the foregoing data suggest, the PVC market was not particularly concentrated prior to the acquisition, whether judged from the perspective of capacity or that of actual production levels. Under the *DOJ Guidelines*, the market after the acquisition would be classified as "moderately concentrated," but only by the barest of margins. Moreover, the 113 point, 112 point, and estimated 110 point changes in nameplate capacity, practical production capacity, and actual production barely exceed the 100 point threshold specified in the *DOJ Guidelines*.[130] The HHI figures also create only a weak presumption of competitive injury under previous court and Commission cases, particularly if—as the respondents maintain—the closure of the other Deer Park plants and the Delaware City plant should not be attributed to the acquisition. In *Weyerhaeuser*, for example, the Commission considered an acquisition that had increased the relevant HHI for actual production by about 100 points *more* than this acquisition to a level about 100 points *higher* than the post-acquisition HHI actually attributable to the acquisition in the PVC market. The Commission concluded that these effects were barely sufficient to create a weak presumption of anticompetitive effects.[131] *A fortiori*, the concentration data for the PVC market create an even weaker presumption of anticompetitive effects. Even if the closure of the other Deer Park plants *is* attributed to the acquisition, the changes in HHI levels are barely comparable to those that occurred in *Weyerhaeuser*. As a result, the evidence from other structural factors needed to rebut that presumption need not be as strong as it was in *Weyerhaeuser*.

2. VCM Market

The record also includes market share data for nameplate capacity, practical production capacity, and actual production levels for VCM. Before the acquisition, Diamond ranked third along all of these dimensions, while Goodrich ranked third in nameplate capacity (tied with Diamond and Georgia Pacific), fifth in practical production capacity, and fourth in actual production. IDF 250 *in camera*, 251 *in camera*. The following tables depict the market shares of the twelve firms in the United States VCM market, and their ranks, for each of the three concentration measures before the acquisition, and for the nine firms still in the industry as of January, 1984:

[130] In her concurring and dissenting opinion, Commissioner Azcuenaga states that the acquisition increased the actual production HHI by 221 points, to 1131, thereby placing the acquisition in the "moderately concentrated" range under the *DOJ Guidelines*. Opinion of Azcuenaga, Commissioner (*hereinafter Azcuenaga Opinion*), at 1. However, this assumes that the closure of Deer Park Plants numbers 1-4X, and the Delaware City plant, should be attributed to the acquisition, and the respondents vigorously dispute that assumption. The acquisition itself probably actually increased the HHI for actual production by only 110 points. *See* page 55 and note 125, *supra*.

[131] *Weyerhaeuser Co.*, 106 F.T.C. at 280.

TABLE IV.— VCM MARKET SHARES BEFORE THE ACQUISITION (PERCENTAGES) (UNITED STATES)[132]

Firm	Nameplate capacity (Jan. 1982)	Practical production capacity (Jan. 1982)	Actual production (1981)
Dow Chem	22.52 (1st)	21.92 (1st)	22.85 (1st).[133]
Shell Oil	16.39 (2nd)	15.61 (2nd)	17.43 (2nd).
Diamond Shamrock	10.64 (3rd)	12.06 (3rd)	13.44 (3rd).

TABLE IV.— VCM MARKET SHARES BEFORE THE ACQUISITION (PERCENTAGES) (UNITED STATES)[132]—Continued

Firm	Nameplate capacity (Jan. 1982)	Practical production capacity (Jan. 1982)	Actual production (1981)
Goodrich	10.64 (3rd)	10.48 (5th)	11.30 (4th).
Ga. Pacific	10.64 (3rd)	11.27 (4th)	6.91 (6th).
PPG Industries	9.59 (6th)	9.41 (6th)	7.57 (5th).
Borden	6.48 (7th)	5.32 (8th)	4.82 (8th).
Conoco	6.39 (8th)	7.33 (7th)	6.79 (7th).
Ethyl	3.51 (9th)	3.38 (9th)	2.90 (9th).
Formosa Plas	3.19 (10th)	3.22 (10th)	2.76 (10th).
Uniroyal			1.75 (11th).
Stauffer Chem			1.33 (12th).
Imports (Excl. Dow)			0.14.
Total	9.3965 billion pounds	8.873 billion pounds	6.856 billion pounds.

[132] CX 662A–C *in camera*; IDF 250–261 *in camera*.
[133] This share includes imports from Dow Canada accounting for 1.5 percent of the market.

TABLE V.— VCM MARKET SHARES AFTER THE ACQUISITION (PERCENTAGES) (UNITED STATES) [134]

Firm	Nameplate capacity (Jan. 1984)	Practical production capacity (Jan. 1984)	Actual production (1983)
Dow Chemical	23.34 (1st)	22.55 (2nd)	28.25 (1st).[135]
Goodrich	22.61 (2nd)	23.73 (1st)	22.26 (2nd).
Georgia Pacific	11.31 (3rd)	11.87 (3rd)	7.89 (6th).
PPG Industries	10.20 (4th)	9.91 (4th)	9.01 (5th).
Shell Oil	9.50 (5th)	8.96 (6th)	12.85 (3rd).
Formosa Plastics	9.37 (6th)	9.67 (5th)	9.02 (4th).
Borden	6.89 (7th)	5.60 (8th)	2.65 (8th).
Conoco	6.78 (8th)	7.71 (7th)	6.99 (7th).
Ethyl	0.0	0.0	1.07 (9th).
Total	8.844 billion pounds	8.427 billion pounds	7.033 billion pounds.

[134] CX 663A–F *in camera*. The decline in Shell's share occurred because it closed a plant (*see* note 97, *supra*), while the increase in Formosa's share occurred because it opened a plant after approximately five years of construction (*see* pages 34–35, *supra*).
[135] This share includes 128,300 pounds in imports from Dow Canada.

The acquisition increased the HHI for nameplate VCM capacity by 226 points, from 1303 to 1529. IDF 262. By January 1985 the HHI had increased to 1632. IDF 266. The acquisition increased the HHI for practical production capacity by 253 points, from 1299 to 1552. IDF 262. By January 1985 the HHI had increased to 1650. IDF 266. The acquisition increased the HHI for actual production by 304 points, from 1359 to 1663. IDF 262. The following table illustrates contemporaneous industrywide changes in both HHI levels and four-firm concentration levels: [136]

TABLE VI.—CHANGES IN VCM, HHI AND FOUR-FIRM CONCENTRATION 1981–1984

Concentration measure	1981	1982	1983	1984	1985
Nameplate capacity [137]	1318	1313	1433*	1559	1632
	(61.66)	(60.19)	(66.89)	(67.46)	(____)
Practical production capacity [138]	1293	1299	1468*	1575	
	(61.92)	(60.86)	(68.49)	(68.06)	
Actual production [139]	1330	1761*	1741		
	(65.02)	(76.14)	(72.39		

[137] CX 663A–B *in camera*.
[138] CX 663C–D *in camera*.
[139] CX 663E–F *in camera*.

The foregoing data indicate that the VCM market was substantially more concentrated prior to the acquisition than the PVC market, and that the acquisition produced a substantially greater increase in concentration in the VCM market. Under the *DOJ Guidelines*, the VCM market falls within the upper half of the moderately concentrated range after the acquisition for all three concentration measures. Moreover, the acquisition increased HHI levels along all three measures by 226 to 304 points, well above the 100 point threshold specified by the *DOJ Guidelines*. Under the more traditional rubric of earlier cases, the acquisition increased the four-firm concentration ratio from 60.2 percent to 70.8 percent in nameplate capacity; from 60.9 percent to 71.3 percent in practical production capacity;

[136] The concentration data in Table VI differ to some degree from the data cited in the text because of other events in the industry. The acquisition occurred in January 1982. The 1983 capacity data and the 1982 production data, denoted by asterisks, are therefore the first to reflect the effects of the acquisition.

and from 65 percent to 72.6 percent in actual production. Furthermore, Goodrich increased its share from 10.6 percent to 21.3 percent in nameplate capacity; from 10.5 percent to 22.5 percent in practical production capacity; and from 11.3 percent to 24.7 percent in actual production. *See* Table IV, *supra*. These data are well above those that created a presumption of illegality in *United States v. General Dynamics* and *Weyerhaeuser*. *See* pages 44–48, *supra*. In short, the concentration data create a relatively strong presumption of anticompetitive effects in the VCM market, and relatively strong evidence from other factors is needed to rebut that presumption.

C. Other Structural Factors

1. Product Homogeneity.

The extent to which products in a given industry are homogeneous helps to determine the likelihood of anticompetitive effects from an acquisition. As the *DOJ Guidelines* indicate:

> In a market with a homogeneous and undifferentiated product, a cartel need establish only a single price—a circumstance that facilitates reaching consensus and detecting deviation. As the products which constitute the relevant product market become more numerous, heterogeneous, or differentiated, however, the problems facing a cartel become more complex. Instead of a single price, it may be necessary to establish and enforce a complex schedule of prices corresponding to gradations in actual or perceived quality attributes among the competing products.[140]

Two dimensions of product heterogeneity are particularly relevant.[141] First, differences in product quality may make price differentials necessary to produce a stable market equilibrium, and achieving a consensus on such differentials is likely to be difficult.[142] Moreover, maintaining a consensus becomes more difficult when it must cover full lines of products of varying qualities, because a firm can disguise its efforts to cheat more easily.[143] Second, if transportation costs represent a substantial proportion of total product value, and if firms are located substantial distances from one another, coordination efforts must minimize or eliminate the competitive impact of these differences.[144]

a. *PVC market.* The record provides mixed evidence concerning PVC heterogeneity. Judge Howder characterized the bulk and suspension PVC market as a "commodity" market, where purchasers generally select the lowest priced resin suitable for a particular end use. IDF 90. However, two factors—the presence of a variety of different grades of PVC resin (with perceived differences within particular grades), and the complications arising from differing transportation costs—establish that PVC resin is in fact considerably more heterogeneous. First, there are three broad categories of PVC resin—pipe, general purpose, and specialty. Each category includes a number of PVC resin grades that are distinguished by differences in particle size, molecular weight, and purity.[145] Some PVC resin purchasers perceive differences in a given grade from one producer to another, or even from one plant of a given firm to another. As a result, they insist upon "qualifying" a particular PVC resin grade before purchasing it from a particular PVC producer.[146] The results of the testing, or subsequent use of the resin, on occasion lead purchasers to conclude that the resin grades involved cannot be used.[147] The need to qualify not only *grades* of resin, but also the grade of resin produced by a *particular* firm, makes PVC buyers reluctant to switch suppliers without price or quality concessions.

Pipe, siding and calender grades of PVC resin, also characterized as "commodity" grades, account for about 75 percent of bulk and suspension PVC sales.[148] Service with respect to these grades is considered to be relatively unimportant. The remaining 25 percent of bulk and suspension PVC resins are sold in several grades that differ in particle size, molecular weight, and purity as a function of purchaser end-use requirements.[149] Nevertheless, it is difficult to charge a significant price premium for any given grade of PVC. As one witness testified,

> there is a degree of customer loyalty in this business, but I would characterize it more as one that will give you an opportunity to *meet the price* in most cases rather than a willingness to pay a premium.[150]

Commissioner Azcuenaga relies upon evidence of this sort to conclude that PVC resin buyers are willing to switch suppliers of a given grade in response to small price differences. *Azcuenaga Opinion* at 8. But switching suppliers of a given grade entails signficant costs. *See* page 88, *infra*. Moreover, the fact that a given PVC grade may be relatively homogeneous does not alter the fact that different PVC grades differ significantly from one another.[151]

Second, transportation cost differences are likely to complicate the determination and enforcement of consensus prices. Although several manufacturers operate PVC resin plants along the Gulf Coast, in Texas, Louisiana and Mississippi, others operate PVC resin plants in widely scattered locations. For example, as of October 1983 Air Products' only plant was located in Pensacola, Florida, while Borden's largest plant was in Illinois, and it operated another substantial plant in Massachusetts. Similarly, as of October 1983 Conoco, Formosa, Georgia Pacific, Occidental, and Tenneco respectively operated substantial plants in Oklahoma; Delaware; New Jersey and Pennsylvania; and New Jersey. Finally, as noted above, Goodrich itself operates substantial plants in Ohio, Illinois, California, Kentucky, and New Jersey.[152]

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[140] *DOJ Guidelines* at ¶3.411; *accord, e.g., HCA v. FTC*, 807 F2d at 1390; *United States v. Container Corp. of America*, 393 U.S. 333, 337 (1969); *United States v. FMC Corp.*, 306 F.Supp. 1106, 1111–12, 1143 (E.D. Pa. 1969); *FTC Statement*, ¶4516 at 6901–4.

[141] *See generally* Scherer, *supra* note 61, at 200–03; Posner, *supra* note 58, at 51.

[142] Scherer, *supra* note 61, at 201. If a significant level of product differentiation exists, each firm will probably confront significantly different demand and marginal revenue curves. Therefore, even if its marginal cost function is identical to those of the other firms in the industry, each firm will prefer to operate at a different point on that function, and hence will prefer a different price than its rivals. *Id.* at 158.

[143] *See* Hay, *supra* note 58, at 448.

[144] Scherer, *supra* note 61, at 201; Haddock, *Basing-Point Pricing: Competitive v. Collusive Theories*, 72 Am. Econ. Rev. 289 (1982); *see DOJ Guidelines* at ¶3.413. For a general discussion of product differentiation, *see* Scherer, *supra* note 61, at 375–405.

[145] Disch, Tr. 632, 634–35; Becker, Tr. 1255–59; Klass, Tr. 4333; RX 2Z11–15.

[146] Becker, Tr. 1330–31, 1332–34; RX 875B *in camera*; RX 222D–E *in camera*; RX 589T; RX 1049A *in camera*; RX 258A *in camera*; RX 537B; RX 541A; *see* H. Wheeler, Tr. 1747–48.

[147] RX 2211 *in camera*; RX 260B *in camera*; RX 545A; RX 1041A.

[148] Weber, Tr. 1795.

[149] IDF 85. For example, medical grade resins are considered to be specialty grades, and command a small price premium over commodity grades. IDF 88. Many customers find technical services offered in conjunction with the sale of specialty grades to be useful. IDF 89.

[150] Schaefer, Tr. 1203 (emphasis added); *accord* Becker, Tr. 1330–1332.

[151] The crucial point about product heterogeneity is that it substantially complicates the determination and enforcement of consensus prices. Instead of establishing a single price for a single homogeneous product, firms must establish and maintain a whole series of prices for a whole series of product grades.

[152] RX 1204G *in camera*; RX 1168A-B *in camera*. Bulk and suspension PVC is generally sold on a delivered price basis (Diamond Admission 475 (CX 6T); Goodrich Admission 432 (CX 4Z28), but it is not clear from the record whether the delivered price is *uniform* throughout the relevant geographic market. If delivered prices are not uniform, then detecting cheating becomes considerably more difficult.

As Commissioner Azcuenaga points out (*Azcuenaga Opinion* at 10), the relevant geographic market is national rather than regional. However,

Continued

b. *VCM Market.* The VCM market is substantially more homogeneous than the PVC market. VCM is produced in only one grade, and there are only minor trace differences in impurity levels from one firm's product to another; there is no customized VCM production. IDF 283, 285. Diamond and Goodrich admit that VCM is an essentially fungible product.[153] Moreover, all except one VCM plant are located along the Gulf Coast, in either Texas or Louisiana. IDF 284 *in camera*. As a result, transportation costs are not a significant source of product differentiation. Furthermore, the VCM industry is technologically stable; significant process or product technological changes are unlikely to occur over the next few years. IDF 285. In addition, VCM firms secure product from one another through exchanges, tolling agreements, and purchases, all for the purpose of resale;[154] that factor supports the conclusion that the product is homogeneous. As one witness testified:

> Most people would say you can't tell [VCM produced by different American manufacturers] apart. It is a true commodity chemical.[155]

2. Price Elasticity of Demand

The price elasticity of demand for a product measures the degree to which a change in its price will produce a change of opposite sign in the quantity of the product that is demanded.[156] As the price elasticity of demand for a product declines, the degree to which an increase in that product's price can be sustained without losing a significant number of sales increases, for two reasons. First, industry firms will find it easier to collude profitably, because an effort to raise prices to supracompetitive levels will not induce as many buyers to switch their purchases to alternative products.[157] Second, industry firms will have a greater incentive to collude, because the additional revenue that any given price increase produces will increase. In particular, when the price elasticity of demand is less than one—with costs held constant—an industrywide price increase will increase rather than reduce industrywide profits.[158]

The likelihood of anticompetitive effects from an acquisition thus increases as the price elasticity of demand for the product at issue declines.[159] Both PVC and VCM are intermediate products, used as inputs in manufacturing final products. As a result, their respective price elasticities increase as (1) the degree to which other inputs can be substituted for them increases; (2) the proportion of total costs for which each accounts increases; and (3) the price elasticity of demand for PVC end products and PVC resin—the products for which they are respectively used—increases.[160]

a. *PVC Market.* Three factors establish that the price elasticity of demand for bulk and suspension PVC resin is relatively low. First, there are no practical substitutes for PVC resin in manufacturing PVC products. IDF 95. PVC resin is the primary raw material input for PVC end use products, and it "imparts essential properties to the product." Much of the fabrication equipment used for bulk and suspension PVC end use products can process only bulk or suspension PVC resins.[161]

Second, with the exception of PVC pipe, bulk and suspension PVC resins account for relatively small proportions of the cost of finished PVC products. All PVC resins must be compounded before they are processed, and at that stage, additives such as heat and light stabilizers, impact modifiers, plasticizers and pigments are added.[162] A variety of manufacturing processes—including extrusion, calendering, blow molding, injection molding and compression molding—must then be used to convert PVC compounds into finished PVC products. IDF 96. The cost of PVC resin accounts for about 55 to 60 precent of the cost of PVC pipe sold to distributors, and a smaller percentage of its final cost installed.[163] However, it accounts for much lower percentages of the cost of all other finished PVC products. For example, it accounts for only about 25 percent of the cost of vinyl siding sold to distributors, and only about 5 percent of its final cost installed.[164] Similarly, it represents only about 13 to 14 cents of the cost of a finished phonograph record. IDF 186–188 *in camera;* Disch, Tr. 659. Finally, it accounts for only a small percentage of the cost of most PVC end products manufactured from calendered PVC resin. IDF 193. For example, it represents 5.6 percent of the retail price of a $7.99 vinyl shower curtain, and 4.5 percent of the retail price of a $1.79 vinyl shower cap.[165] Because there are no substitutes for PVC resin in fabricating PVC end-use products, and because PVC resins generally account for only small percentages of the final costs of fabricating those products, the demand for bulk and suspension PVC resin is less price elastic than the demand for PVC end use products.[166]

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transportation cost differences need not be large enough to create regional markets in order to complicate the task of developing a single consensus price, particularly given the fact that PVC plants are scattered all over the country.

[153] Goodrich Admission 465 [CX 4Z33]; Diamond Admission 505 [CX 6U]; Taylor, Tr. 1565; Klass, Tr. 5363.

[154] CPF 24.09, *citing, e.g.*, CX 557Z11 *in camera*; L. Wheeler, Tr. 972–75 *in camera*; CX 88 *in camera*.

[155] Keinholz, Tr. 813. Respondents nevertheless describe VCM as "commercially heterogeneous" because of differences in sales terms from one producer to another, including price, credit terms, method of delivery (pipleline, rail tank car, or tolling arrangement), and contract length (short-term, long-term, or spot). IDF 286 *in camera*; RPF 403 *in camera*. These factors relate to industry performance, rather than structure, however, and performance factors are discussed in Part V, *infra*. In any event, as the Commission has previously indicated, "agreements as to all aspects of competition are not necessary for effective collusion to take place and to have a negative impact on competition." *HCA*, 106 F.T.C. at 508; *accord Catalana, Inc. v. Target Sales, Inc.*, 446 U.S. 648–650 (1980) (agreement to refuse to extend credit *per se* illegal).

[156] More formally, the price elasticity of demand can be expressed as the absolute value of the product of (1) price divided by quantity, and (2) quantity demanded differentiated with respect to price. *E.g.*, Scherer, *supra* note 61, at 157 n. 13.

[157] *HCA v. FTC*, 807 F.2d at 1388; *HCA*, 106 F.T.C. at 499.

[158] *See HCA v. FTC*, 807 F.2d at 1388. A monopolist will ordinarily raise prices until the price elasticity of demand is greater than one. At that point, an increase in prices may or may not increase profits, depending upon whether costs are increasing faster or more slowly than revenues. Kaserman, Tr. 2354–55, 2363–64.

[159] *HCA v. FTC*, 807 F.2d at 1388, 1389; *Marathon Oil Corp. v. Mobile Oil Corp.*, 669 F.2d 378, 381 (6th Cir. 1981), *cert. denied*, 455 U.S. 982 (1982); *FTC Statement*, ¶4516 at 6901–3; *see also United States v. Container Corp. of America*, 393 U.S. at 337; *Wall Products Co. v. National Gypsum Co.*, 326 F. Supp. 295, 300 (N.D. Cal. 1971).

[160] *E.g.*, M. Friedman, *Price Theory* 158 (1976); IDF 287, *citing* Kaserman, Tr. 2369–71.

[161] H. Wheeler, Tr. 1751–52.

[162] For example, flexible PVC compounds used to manufacture wire, cable and flexible sheeting are produced by adding plasticizers to the resins. As a result, they frequently contain only 50 to 70 percent PVC resin by weight. By contrast, rigid PVC compounds do not contain plasticizers, and therefore contain as much as 80 to 95 percent resin by weight. IDF 96; Disch, Tr. 659.

[163] Yu, Tr. 2104; Disch, Tr. 663.

[164] IDF 163 *in camera;* Belt, Tr. 2026–27, 2040–41 *in camera;* CX 756Z59. Similarly, PVC resin accounts for only 15 to 20 percent of the cost of vinyl floor tiles (Disch, Tr. 673–74; IDF 168), and for no more than 30 to 50 percent of the cost of the PVC compounds used to fabricate bottles and wire and cable insulation. Becker, Tr. 1305–07, 1318–19; IDF 178; Disch, Tr. 660–61. It accounts for 15 percent of the price of vinyl window fabricators, and only 3 percent of the price of installed vinyl windows. Belt, Tr. 2058–61 *in camera*.

[165] IDF 193; DiLiddo, Tr. 3376–79.

[166] Kaserman, Tr. 2375–78.

Third, although the price elasticity of demand for different finished PVC products varies substantially, it is relatively low for most such products. It is lowest in the wire and cable segment, the packaging film and sheet segment, the phonograph record segment, and the medical end use segment. These segments together account for 21 to 23 percent of total domestic PVC consumption. *See* pages 18–19 and note 42, *supra*. The price elasticity of demand for PVC pipe, siding, floor tile, and window frames is higher because of competition from products manufactured from alternative materials, but is still relatively low. For example, a 1983 Goodrich analysis indicated:

> PVC pipe manufacturers appear to have plenty of room for price increases before approaching the price levels of most competing materials. (Even if the prices were identical, PVC would still have the added advantage of lower installed cost.)

CX 247A *in camera*. These segments together account for 53 to 55 percent of total domestic PVC consumption. *See* pages 18–19 and note 42, *supra*. Finally, the price elasticity of demand for rigid and flexible calendered products and bottles is considerably higher because of competition from products manufactured from alternative materials. These segments together account for 21 to 27 percent of total domestic PVC consumption. In short, the price elasticity of demand for products accounting for 73 to 79 percent of total domestic PVC consumption is relatively low.

On balance, the price elasticity of demand for most PVC resins appears to be relatively low. There are no practical substitutes in manufacturing PVC products; PVC resin generally accounts for only a small percentage of the final prices of those products; and the price elasticity of demand for most PVC end products is relatively low. One witness confirmed that for the bulk and suspension PVC market overall, there was very little price sensitivity,[167] and another stated that PVC is not a price elastic market.[168]

b. *VCM Market.* The price elasticity of demand for VCM is very low, on the basis of the three criteria discussed *supra*. IDF 287, 288. First, no other input can be substituted in producing PVC.[169] As a result, VCM's price elasticity of demand is necessarily lower than that of PVC.[170] Second, the price elasticity of demand for PVC is itself relatively low. The third criterion is less conclusive; VCM accounts for 50 to 60 percent of the cost of producing PVC.[171] When considered together, these three criteria indicate that the price elasticity of demand for VCM is lower than that of PVC resin, and hence very low in an absolute sense. This analysis is consistent with the views of a number of Goodrich employees and trial witnesses that the demand for VCM is "absolutely inelastic."[172]

3. Cost Functions

The similarity of cost functions among industry firms also affects the likelihood of anticompetitive effects from an acquisition. If cost functions vary widely from one firm to another, each will prefer a different industry price level, and developing a collusive consensus price will consequently be more difficult.[173] If there are only a few firms in the industry, cost differences nevertheless may not prevent firms from accepting price or output levels somewhat different from their optimal levels.

a. *PVC Market.* PVC production costs vary significantly among producers. These cost differences occur in two of three broad cost categories: (1) The cost of converting VCM into PVC; and (2) the cost of transporting PVC to purchasers.[174] First, PVC production costs differ significantly from one firm to another. It is true that the technology needed to produce PVC is widely available to all producers, and no significant patents impede production by any particular firm. IDF 195. Moreover, the clear trend in the industry has been toward larger reactors. A Goodrich employee and another witness estmated that raw materials efficiency in these larger reactors is close to 100 percent.[175] Several industry witnesses testified that producer manufacturing costs using large reactors were similar,[176] and about two-thirds of installed capacity is in the form of larger reactors. IDF 198; Disch. Tr. 641.

Nevertheless, the remainder of industry capacity is in the form of smaller reactors that produce a variety of specialty resins. As a result, production costs vary significantly from one PVC resin grade to another.[177] For example, pipe resins are usually produced in highly efficient large reactors, and require little or no technical customer service. RX 34R; Klass, Tr. 4322. By contrast, specialty resins are costlier to produce, because

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[167] Becker, Tr. 1325–28; *accord* CX 297z1–Z2 *in camera*.

[168] Schaefer, Tr. 1141; *accord* CX 295Z53–Z54 *in camera*. Respondents' expert testified that very likely were there to be a sustained anticompetitive price increase in PVC, there would be a substantial degree of substitution. Klass, Tr. 4151. However, most of the record evidence supports our conclusion that the price elasticity of demand for PVC is relatively low.

[169] Kaserman, Tr. 2484; Diamond Admission 57 (CX 6D).

[170] Kaserman, Tr. 2484–85; Klass, Tr. 4003–4006, 4533.

[171] In response to a question at oral argument from then-Acting Chairman Calvani, counsel for Goodrich indicated that in 1984, the cost of VCM represented 55.6 to 62.3 percent of the cost of producing suspension resin; 49.6 to 61.3 percent of the cost of producing pipe grade suspension resin; and 49.6 to 61.9 percent of the cost of producing flexible grade suspension resin. Letter from Robert H. Rawson to Acting Chairman Calvani (February 6, 1986), at 2 *in camera*. The Commission hereby makes the Rawson letter—and the response filed by complaint counsel—a part of the *in camera* record in this proceeding.

The Rawson letter estimates are consistent with other record evidence. One study indicates that in January 1983, VCM accounted for 54 to 62 percent—as an average among PVC producers—of the "total cash cost" of producing PVC. RX 1213H *in camera; see* CX 246 *in camera*. A second 1981 study conducted by Air Products suggests that VCM accounts for 65 to 75 percent of total PVC production costs. RX 57A *in camera*.

[172] Lefebvre, CX 296Z72 *in camera; accord* Schaefer, CX 295Z4 *in camera;* Becker, CX 297Z6–7 *in camera; see also* Kienholz, Tr. 811–12; Taylor, Tr. 1705.

[173] *See FTC Statement*, ¶ 4516 at 6901–4. Profit maximization is a function of both marginal cost and marginal revenue. High-cost firms will usually prefer higher umbrella price levels and lower output levels than firms with lower costs. *See, e.g.*, Posner, *supra* note 58, at 51.

[174] The third broad category is the cost of acquiring (or producing) and transporting VCM. Respondents estimate that in 1980, integrated firms' cost of producing VCM varied by up to 3 cents per pound, when the new materials used are valued at market prices. RAB at 42–43. Of course, the allocation of joint costs in integrated firms is necessarily arbitrary, and presents a notoriously difficult accounting problem.

It seems unlikely that VCM cost differences between integrated and nonintegrated producers are either significant or persistent. As complaint counsel point out, the "opportunity cost" of VCM, rather than its actual production cost, should be attributed to vertically integrated PVC producers. The opportunity cost is the price at which an integrated firm could sell VCM if it did not use it internally. *See* Scherer, *supra* note 61, at 305; Stigler, *supra* note 61, at 105. If internal VCM costs were persistently lower than opportunity costs, nonintegrated producers would not be able to compete with integrated producers. *See, e.g., Azcuenaga Opinion* at 13 n.22, *citing* Klass, Tr. 5337–38; IDF 203. One would also expect entry into the PVC market to require simultaneous entry into the VCM market. Respondents make no such claim.

With respect to VCM transportation costs, PVC producers that receive VCM via pipeline realize a cost advantage of 0.5 cents to 1.0 cent per pound. RPF 292 *in camera, citing* RX 57Z62 *in camera*.

[175] DiLiddo, Tr. 3395; Disch, Tr. 641–43.

[176] IDF 199; Disch, Tr. 645; Schaefer, Tr. 1149.

[177] The cost of producing general purpose PVC resin may be as much as [——] cents per pound lower in a large reactor than in a small reactor. RX 875V–W *in camera*. Most firms operate several different sizes of reactor. For example, Tenneco operates some 3,750 gallon reactors at its Burlington, New Jersey plant, and some 34,000 gallon reactors at its Pasadena, Texas plant. Disch, Tr. 638. Reactors with a capacity of 18,000 to 50,000 gallons are classified as large reactors. Disch, Tr. 640.

they tend to be manufactured in less efficient smaller reactors, and require more technical customer services.[178]

Because different firms use reactors of different sizes to produce different PVC resins, their production costs differ significantly. A 1982 Goodrich cost study of eight PVC producers indicated that "total plant operating costs" for producing PVC varied among plants from 14.30 cents per pound to 21.94 cents per pound.[179] These cost differences are accentuated by the fact that different PVC producers emphasize the production of different PVC grades.[180]

Second, as noted *supra*, transportation costs differ to some degree from one PVC producer to another. In particular, significant locational differences mean that PVC producers incur different costs in shipping PVC resin throughout the United States.[181] Complaint counsel maintain that most PVC is sold on a delivered price basis, and that price differences based on location have therefore effectively been eliminated. CPF 7.14. However, although uniform delivered pricing may have this effect, it is unclear whether delivered PVC prices are in fact uniform. Thus, transportation cost differences may further complicate any effort at price and output coordination in the PVC market.[182]

b. *VCM Market.* VCM production costs are much more similar from one VCM producer to another. There are two basic categories of manufacturing costs: (1) The cost of ethylene and chlorine feedstocks; and (2) the cost of converting them into VCM. IDF 290 *in camera*. In addition, transportation costs must be considered. Raw material costs are virtually identical. Virtually all VCM plants produce VCM from ethylene and chlorine feedstocks.[183] Ethylene and chlorine must be used in fixed proportions to produce VCM (60 percent chlorine and 40 percent ethylene), all firms use them in those proportions, both are highly homogeneous products, and VCM producers therefore pay similar prices for them.[184]

Second, all producers have access to similar production technologies, which permit the production of large volumes at low cost, because there are no significant patent barriers. IDF 291. Respondents' expert testified:

> [M]ost producers, if not all, have access to effective production technology which enables them to produce large volumes at low costs.[185]

Another witness testified that in the VCM market, no firm has

> a peculiar proprietary niche or some position that allowed [one firm] to achieve returns or earnings that somebody else couldn't
> * * *[186]

Furthermore, because VCM manufacturers produce only one grade of VCM, there is no reason—unlike the PVC market—to retain both large and small reactors. As a result, all VCM producers operate large, highly efficient plants. Several witnesses confirmed that all VCM producers have similar manufacturing costs. One estimated that short-run avoidable costs differed by only one-half cent per pound among firms in the industry.[187] Two other witnesses agreed that there is no significant cost disparity from one firm to another.[188] A 1981 Air Products study similarly concluded that VCM processing costs varied little from one VCM firm to another.[189]

Third, transportation costs do not differ significantly from one VCM producer to another, primarily bacause all except one domestic VCM plant are located along the Gulf Coast in Texas and Louisiana.[190] On balance, the record evidence establishes that VCM production costs are relatively similar across firms. Although respondents have identified some minor differences,[191] absolute congruence is not needed to heighten the likelihood of anticompetitive effects from the acquisition.

4. Size Distribution of Purchasers

The size distribution of purchasers of the relevant product may also affect the likelihood of anticompetitive effects from an acquisition. If a small number of buyers accounts for a large percentage of total product purchases, that may constrain the pricing discretion of product manufacturers to some degree.[192] By contrast, a large number of buyers are not likely to be able to constrain manufacturer pricing discretion.

a. *PVC Market.* It seems unlikely that PVC purchasers could, by virtue of their size, constrain the exercise of market power by PVC producers. One 1979 Goodrich study indicated that the largest PVC buyer (Carlon) accounted for less than 7 percent of the PVC market, and that 300 PVC buyers together accounted for 80 percent of the market. The study indicated that the

> customer base is attractive because it is readily identifiable, small enough to be reached by a manageable and economic sales force, yet not so concentrated that one or two customers can put enormous pressure on the suppliers to lower price. The biggest customer in the PVC business (Carlon) accounts for less than 7 percent of the total market.

CX 53J–K; *accord*, CX 64P,S. That pattern is also present in many of the product market segments. For example, Goodrich studies from the late 1970's identify 136 wire and cable purchasers (purchasing 8.4 percent of total PVC production); 166 flexible resin purchasers (18.1 percent); and 263 specialty resin purchasers (2 percent). IDF 216. The pipe segment is somewhat more concentrated on the buyer side. Although 100 buyers purchase pipe resin (accounting for 40 percent of total PVC production), the four largest purchasers

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[178] Becker, Tr. 1330–32; Arp, Tr. 3519–20; RX 34R; RX 639E. Giles Disch testified that there would be no economic advantage to Tenneco to construct a new small reactor plant today. Disch, Tr. 640. No new small reactor plant has been built in the United States since the late 1960's. Disch, Tr. 642.

[179] RX 1168A–B *in camera*; RX 245–0 *in camera*; RAB at 43, *citing* RPF 290–92; *accord* DiLiddo, Tr. 3224–26. Of course, these differences are not surprising because the plants studied produce a wide variety of PVC resins. During the 1981–1983 period, the average selling price of "general purpose PVC resin" ranged from 17 cents per pound to 35 cents per pound. RPF 291, *citing* CX 671A–C, F–H; RX 244A.

[180] RX 1170A; Klass, Tr. 4321–22.

[181] RPF 295 *in camera*, *citing* RX 1168A; RX 13K; RX 13Z5; McMath, Tr. 1956–57; RX 34Q; RX 264B; RX 325H; RX 945A–O; *see* page 67, *supra*.

[182] Complaint counsel also argue that locational differences "cancel out;" that is, the cost of shipping incoming VCM cancels out the cost of shipping outgoing PVC. IDF 201; ID at 61 n. 42. However, the VCM may originate in a location different and distant from the destination of the PVC into which it is converted.

[183] IDF 292 *in camera*. The one exception is a plant owned by Borden which produces VCM using a much older acetylene process. That plant accounts for only 2 percent of practical production capacity. *Id.*

[184] IDF 293–294 *in camera*; Goodrich Admissions 59–60; CX 41; L. Wheeler, Tr. 917–18.

[185] Klass, Tr. 4009.

[186] Kienholz, Tr. 884.

[187] L. Wheeler, Tr. 936–38.

[188] Kienholz, Tr. 814; Taylor, Tr. 1570.

[189] RX 57Z29, Z131 *in camera*; *accord* RX 677B *in camera*.

[190] RX 57Z6 *in camera*. The only exception is Goodrich's Calvert, Kentucky plant. *Id.*

[191] *See* RPF 410 *in camera*, *citing* RX 877D; RPF 411–412 *in camera*; RAB at 42–43. For example, respondents argue that VCM producers confront dissimilar raw materials costs as a function of whether or not they are integrated upstream into chlorine and caustic soda production. RPF 411 *in camera*. However, as discussed in note 174 *supra*, the appropriate cost at which to evaluate an internally transferred input is its market price (opportunity cost), because that is the value the integrated firm gives up by using the input internally instead of selling it on the open market. Moreover, even if upstream integration could be a source of differentiation, it would have little significance in this case because in 1983 firms accounting for nearly 80 percent of total VCM practical production capacity *were* integrated into chlorine production. Only Borden, Shell and Conoco were not so integrated. RX 246.

[192] *HCA v. FTC*, 807 F.2d at 1391, *citing* Stigler, *supra* note 61 at 39, 43–44; *see FTC Statement*, ¶4516 at 6901–4; *DOJ Guidelines* at ¶3.42.

account for 60 percent of that total, or 24 percent of total PVC production.[193]

b. *VCM Market.* The level of concentration among VCM purchasers is considerably greater. Seven PVC producers—Air Products, CertainTeed, Keysor-Century, Occidental, Pantasote, Shintech and Tenneco—do not produce VCM, and therefore must purchase it from other firms.[194] Nevertheless, concentration levels are substantially higher among VCM producers than among VCM buyers; only three nonintegrated VCM producers accounted for approximately one-half of VCM production in 1982. It therefore seems unlikely that VCM buyers could constrain the pricing discretion of VCM sellers to any significant degree.

5. Transaction Characteristics

The manner in which sales are typically made in an industry also affects the likelihood of anticompetitive effects from an acquisition, for two reasons. First, if most firms make only a few sales each year, their incentives to cheat are likely to be high. Each additional sale contributes substantially to income, and the risk of effective retaliation from competitors is correspondingly reduced. On the other hand, if the typical firm makes many sales each year, the value of cheating on a given transaction is not substantial and the prospect of effective retaliation may be correspondingly greater.[195] Second, when sales are made openly, cheating can be detected quickly and easily, and retaliation by rival firms is consequently more likely. On the other hand, when sales are made through private negotiations, it is much more difficult to detect and punish secret price concessions.[196]

a. *PVC Market.* Approximately 50 to 60 percent of bulk and suspension PVC resin is sold pursuant to written contracts, normally one year in duration.[197] Although the contracts may specify an expected volume for the entire year, buyers typically advise sellers each month of the amount they will purchase the following month.[198] Thus, in practical effect, buyers purchase product on a monthly or even daily basis.[199]

PVC sales contracts also typically do not specify the prices that are to prevail throughout the contract term. Instead, they rely upon "competitive price provisions," in which a buyer notifies the seller when it has

> a competitive offer for equal terms, equal quantities, equal time situations, which allows us as the seller to generally either meet that new criterion or decline * * * [and] not supply that volume stipulated.[200]

In short, pursuant to these clauses, buyers are permitted to cancel purchases if they can secure lower prices elsewhere, but are required to give sellers the opportunity to meet competing offers. IDF 211 *in camera.* The competitive price provisions ensure that PVC sellers quickly discover price concessions offered by competing firms. *See* IDF 237.

A significant proportion of the remaining 40 to 50 percent of PVC sales is made pursuant to an ongoing customer-supplier "handshake" relationship, in which orders are placed and filled on a "current market conditions" basis.[201] These relationships are relatively secure because of certain peculiarities associated with any given brand of PVC resin. A particular supplier's PVC resin must be tested on a customer's fabricating equipment, and the equipment must be adjusted to the resin's formulation before that customer can use it.[202] Customers are therefore reluctant to switch suppliers, and will not do so when competing prices are identical. IDF 220. Moreover, although some firms buy PVC from more than one supplier, they fill their requirements for a given plant from one supplier, in order to ensure plantwide consistency. IDF 221. These considerations lead customers buying on a "handshake" basis to notify their sellers of competitive offers, so that suppliers regularly receive information concerning lower prices from these buyers as well. IDF 237.

These factors together suggest that the frequency and size of transactions in the PVC market increase the likelihood of anticompetitive effects from the acquisition in that market.

b. *VCM Market.* Contracts for the purchase of VCM are typically quite similar to PVC purchase contracts; they are discussed in detail in Part IV.C.7, *infra.* As a result, the frequency and size of VCM purchase transactions similarly increase the likelihood of anticompetitive effects in the VCM market. Of course, a substantial proportion of VCM production is manufactured by firms that are integrated into PVC production. The significance of that fact is also discussed in detail in Part IV.C.7, *infra.*

6. Stability and Predictability of Demand and Supply Conditions

The stability and predictability of demand and supply conditions also help to determine the likelihood of anticompetitive effects from an acquisition. Greater stability and predictability make it easier to create and sustain a collusive arrangement. By contrast, shocks that suddenly alter demand or supply conditions may complicate collusion. In industries in which fixed costs are a high percentage of total costs, the presence of substantial excess capacity—as a result of a sudden decline in demand—may place strong downward pressure on prices.[203] Firms may in the short run be willing to sell at prices below their average total costs, because prices at such levels, in addition to covering all variable costs, cover at least a portion of their fixed costs. However, fixed costs are not a particularly large proportion of total costs in either the PVC or the VCM market. *See* note 171, *supra,* and page 92 and 94, *infra.* Moreover, during periods of demand growth, such as the period beginning in 1983 and continuing today, any pressure to reduce PVC or VCM prices that producers' fixed costs might have created has disappeared, because capacity utilization has returned to high levels.

a. *PVC Market.* Demand for PVC grew rapidly in the 1960's and 1970's, largely because of growth associated with construction applications. In the 1960's the industry grew at an average annual rate of 13 to 15 percent, but that rate declined to 10 to 11 percent in the early 1970's. IDF 233; IDF 234 *in camera.* The average annual growth rate then fell to 8

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[193] IDF 216–217; Disch, Tr. 683; *see* RPF 336 *in camera, citing* RX 35E; RX 639D; RX 639B.

[194] IDF 78. The remaining five PVC producers—Goodrich, Formosa, Georgia Pacific, Borden and Conoco—are fully integrated upstream into VCM production. *Id.* The three remaining VCM producers are not integrated downstream into PVC production. *Id.*

[195] *DOJ Guidelines* at §3.42; Scherer, *supra* note 61, at 220–22; Hay, *supra* note 58, at 450.

[196] Scherer, *supra* note 61, at 222–25; Hay, *supra* note 58, at 450–51.

[197] IDF 211 *in camera,* 219 *in camera;* DiLiddo, Tr. 3253 (Goodrich: 60 percent contract business; 20 percent "handshake type of relationship;" 20 percent "spot basis"); Weber, Tr. 1790 (Diamond: "Well over 50 percent was sold under contract."); Disch, Tr. 685.

[198] *E.g.,* Disch, Tr. 685.

[199] IDF 218; Disch, Tr. 707, 728; McMath, Tr. 1897, 1951; Schaefer, Tr. 1140, 1200; *see* RX 899A.

[200] Disch, Tr. 684; *accord* DiLiddo, Tr. 3254–55; Weber, Tr. 1789–90. On the significance of similar provisions for facilitating collusion, *see generally* Salop, *supra* note 58; Clark, *supra* note 58.

[201] IDF 219 *in camera.* The remaining proportion of PVC sales is made on the spot market.

[202] Yu, Tr. 2159; DiLiddo, Tr. 3371–72; H. Wheeler, Tr. 1747–48.

[203] *See, e.g.* Hay, *supra* note 58 at 450; Scherer, *supra* note 61, at 209.

percent by the end of the 1970's, and since 1979 the industry has grown at an average rate of 3 to 4 percent annually. IDF 234. A number of witnesses testified that PVC resin is a "mature product," and that annual growth will approximate annual GNP growth (3 to 4 percent annually) for the foreseeable future. IDF 235; Disch, Tr. 692.

Capacity utilization levels in the PVC market vary with general economic conditions, particularly conditions in the construction industry. Respondents note that in the 1980's construction has accounted for "well over 50% of PVC consumption.[204] The most relevant measure of capacity is practical production capacity, because it determines the amount of capacity that can be placed in production at little additional marginal cost. Between 1970 and 1974, practical production capacity ranged from 96 percent in 1970 to 94 percent in 1973, and never fell below 93 percent. In 1974, with the onset of the recession, capacity utilization fell to 89 percent, and to 64 percent in 1975, before climbing to 78 percent in 1976, 86 percent in 1977, 94 percent in 1978, and 93 percent in 1979. In 1980, when interest rates rose and construction declined, capacity utilization fell to 80 percent. It remained at 80 percent in 1981, fell with the recession to 75 percent in 1982, increased to 84 percent in 1983, and increased again to an estimated 91 percent in 1984.[205] A number of witnesses testified that capacity utilization levels would continue to increase gradually during the 1980's.[206] Several record documents indicate that an 80 percent capacity utilization level makes PVC resin prices profitable. For example, a 1983 Goodrich document indicates that "industry capacity utilization around 80% * * * [h]istorically * * * has supported price increases * * *"[207]

Respondents argue that there is substantial excess capacity in the PVC industry, as a consequence of producer forecasting errors and the severity of the recent recession. IDF 241–242. Although this was apparently true during the recession, capacity utilization has recently rebounded to a high level. As a result, any incentive to cheat on consensus prices in response to depressed demand is not likely to persist over the next several years. That is particularly true because fixed costs do not generally represent a particularly large percentage of total costs in the PVC market. A 1983 study, for example, estimates that variable costs account for approximately 69 to 76 percent of the total cost of producing PVC resin.[208]

Supply conditions are similarly likely to remain relatively stable and predictable over the next several years. VCM is the primary input used to manufacture PVC, and ethylene and chlorine are in turn the primary inputs used to manufacture VCM. Ethylene is a petroleum compound, and its price is not likely to increase significantly over the next several years, given the fact that petroleum prices have recently declined and are likely to remain low for the foreseeable future. Chlorine prices are also relatively stable, and are likely to remain so for the next several years.

b. *VCM Market.* Because 96 percent of all VCM production is used to produce PVC, demand for VCM is closely tied to demand for PVC. In the 1960's, the VCM market grew at an average annual rate of 12 to 15 percent, but that rate declined to 8 to 10 percent in the early 1970's. IDF 313–14; Kienholz, Tr. 792. Industry witnesses indicated that they expect the VCM growth rate to approximate GNP growth (3 to 4 percent annually) for the foreseeable future. IDF 315 *in camera*; IDF 316; Kienholz, Tr. 792.

Capacity utilization levels in the VCM market also vary with general economic conditions, and in particular with conditions in the construction industry. In 1979 the VCM market operated at 96 percent of its practical production capacity, but that level fell to 83 percent in 1980, 77 percent in 1981, and 74 percent in 1982, before increasing to 75 percent in 1983 and to an estimated 92 percent in 1984.[209] Historically, an 80 percent operating rate has permitted VCM producers to earn small profits, while a 90 percent operating rate has permitted them to achieve "longterm reasonable return objectives." Kienholz, Tr. 807.

Respondents contend that VCM producers currently confront substantial excess capacity, and that it will persist for the foreseeable future. IDF 323. However, several witnesses testified that the excess capacity developed because of the recession; that capacity utilization improved in 1984; and that it is expected to further improve over the next few years to such an extent that new capacity may be needed by 1990. IDF 325 *in camera*; IDF 326; *see* Kienholz, Tr. 796–97. The 1984 capacity utilization data support that conclusion. Moreover, even lower capacity utilization levels are not likely to place strong downward pressure on prices because fixed costs do not represent a very large percentage of total costs. For example, the 1981 Air Products study indicates that at least 50 percent of total VCM production costs are variable costs. *See* RX 57Z30 *in camera*.

Supply conditions are also likely to remain stable for the next few years. As we observed *supra*, chlorine and ethylene are the primary components of VCM, and prices for both are likely to remain relatively stable for the foreseeable future.

7. Significance of Vertical Integration

The degree to which firms within an input ("primary" or "upstream") industry are integrated into a "secondary" (or "downstream") industry may affect both their incentives to create a coordinated price and output strategy, and their ability to maintain that strategy by detecting and punishing efforts to deviate from it. These two concepts are closely related. For example, firm incentives to coordinate prices and output are likely to be higher if firms believe they will be able to monitor the behavior of their competitors. An acquisition involving one or more integrated firms in either the primary or the secondary market may alter that balance for the firms involved, and thereby frustrate or facilitate collusion in either market.[210]

[204] RPF 103 *in camera, citing* RX 1173A. Construction applications include pipe, wire and cable, siding, and floor tile. *See* pages 18–19, *supra*.

[205] CX 666H *in camera*. The cited capacity utilization levels are for January of each year cited. The 1984 figure is based upon the assumption that bulk and suspension PVC production increased by 12 percent in 1984, as reported by the Society of the Plastics Industry (*see* CX 778C), while capacity did not increase. CPF 17.08 n. 1 *in camera*.

Nameplate capacity utilization levels exhibit a similar association with economic conditions, ranging from 88 percent in 1970 to a low of 56 percent in 1975, to a peak of 88 percent in 1978, to a low of 71 percent in 1982, and to an estimated high of 87 percent in 1984. CPF 17.03 *in camera, citing* CX 666H *in camera*.

[206] Disch, Tr. 691–92; Schaefer, Tr. 1123; Eades, Tr. 1473–74, 1480; H. Wheeler, Tr. 1736–37; CX 220C.

[207] CX 185Z6–27 *in camera; accord* Schaefer, Tr. 1124; RX 840B.

[208] RX 1213 *in camera; see* RX 428P *in camera*.

[209] CX 665A–F *in camera*. The cited capacity utilization levels are for January of each year cited. The 1984 figure is based upon the assumption that VCM production, like PVC production, increased by 12 percent in 1984. *See* note 205, *supra*. Nameplate VCM capacity utilization levels changed in a similar fashion, from 92 percent in 1979 to a low of 70 percent in 1982 and 1983, and then to an estimated 87 percent in 1984. CX 665A–F *in camera*.

[210] The presence of vertical integration may also affect firm incentives to engage in anticompetitive conduct other than collusion, such as the anticompetitive foreclosure of unintegrated downstream producers from purchasing an input manufactured by previously unintegrated upstream producers. *See* Krattenmaker & Salop, *Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price*, 96 Yale L.J. 209 (1986); Salinger, *Vertical Mergers and Market Foreclosure*

Continued

a. *Effects on Firm Incentives to Cooperate.* The effects of vertical integration upon firm incentives to collude will depend upon whether any given integrated firm on balance will benefit from or be harmed by collusion. It is perhaps easiest to appreciate these effects by considering the incentives favoring collusion in the primary (upstream) market—in this case, the VCM market. The foregoing analysis establishes that collusion would be both possible and profitable in the VCM market. Firms that are *not* integrated downstream into the secondary (PVC) market will therefore have a strong incentive to increase primary market prices to supracompetitive levels. VCM producers that *are* integrated downstream are likely to have an equally strong incentive to increase VCM market prices, because they can produce either as much VCM as they need—or more than they need—to supply their PVC operations.

First, if integrated VCM producers can manufacture only enough VCM to supply their own PVC operations, then an industrywide increase in VCM market prices will permit them to increase their PVC prices, because nonintegrated PVC producers will have to increase their prices in order to accommodate the VCM price increase.[211] Thus, these integrated firms may actively participate by *reducing* their own captive production. Alternatively, they may passively welcome collusion in the primary market—in the sense that they will profit from declining to increase VCM production in response to higher VCM prices—thereby allowing unintegrated VCM producers to reduce their output and secure higher VCM prices. Second, if integrated firms can produce more VCM than they need for PVC production—and hence can make some open market VCM sales—they will secure additional revenues from an increase in VCM prices. In both of these situations, therefore, integrated firms will have an incentive to support an increase in VCM market prices, and hence to support a collusive effort in that market.[212] All integrated VCM producers now fall into one of these two categories (*see* Table II and Table V, *supra*), and therefore have the incentive to support a collusive effort to raise VCM market prices.

If, by contrast, an integrated firm produces more of the secondary market product than it can sustain with its own primary market production, and hence must purchase additional primary market inputs from other firms, that may reduce its interest in higher primary market prices, although its secondary market revenues would still benefit from higher primary market prices. Goodrich found itself in this position prior to the acquisition, when it controlled 1.192 billion pounds of PVC practical production capacity, but only 930 million pounds of VCM practical production capacity. *See* Table VII, *infra*. If some integrated firms can produce more of the primary product than they need while others cannot, their incentives with respect to primary product price levels will differ to some degree.[213] None of the integrated VCM producers currently fall in the latter category.

b. *Effects on Firm Monitoring Efforts.* Any firm that participates in a collusive effort—whether it is integrated or not—will prefer to see its competitors keep their prices uniformly and persistently at supracompetitive levels, so that it can both sell its output at supracompetitive prices and secure additional profits by cheating on the consensus. Colluding firms must therefore be able to enforce their consensus by detecting and retaliating against cheating on the consensus.

Vertical integration may affect the extent to which colluding firms can enforce their consensus in two ways. First, if some integrated firms produce more of the primary product than they use internally, nonintegrated primary producers must be able to monitor open market sales of the primary product by integrated firms. This monitoring task is no different from the monitoring required to sustain a collusive arrangement among nonintegrated firms, and conditions in the VCM market permit VCM producers to monitor integrated firm VCM sales.

Second, the colluding firms must be able to monitor secondary market sales by integrated firms, because cheating through "reductions" in the "price" of the primary product that integrated firms use internally can take the form of additional secondary market sales. In general, the colluding firms can rely on the integrated firms as a group to monitor their integrated competitors. More precisely, if several firms accounting for a substantial percentage of primary market output are vertically integrated, each can be expected to monitor carefully the secondary market prices of its integrated competitors, and to retaliate quickly if cheating in that market or in the primary market occurs.[214] The speed with which price reduction information reaches nonintegrated producers will increase as the integrated producers' collective share of secondary market share increases. Integrated VCM producers currently account for approximately 50 percent of VCM production.

A second monitoring mechanism allows information on the downstream behavior of the integrated firms to reach nonintegrated upstream producers, so that the nonintegrated firms may participate in policing secondary market cheating by integrated firms. If the nonintegrated VCM producers observe a reduction in orders from their nonintegrated PVC producer customers—accompanied by customer complaints of a price squeeze (or complaints that their PVC fabrication customers report a price squeeze)—they

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(Working Paper No. FB–84–17, Graduate School of Business, Columbia University 1985). We do not need to consider other anticompetitive mechanisms in the present case in view of our finding of liability based upon an increase in the likelihood of collusion in the VCM market. In addition, a vertical acquisition may reduce the type of inefficiency described in the economic literature on successive monopolies. *See, e.g.*, Waterson, *Vertical Integration, Variable Proportions, and Oligopoly*, 92 Econ. J. 129 (1982). However, this case focuses on a horizontal, rather than a vertical, acquisition.

[211] If the price elasticity of demand for the output is low—as it is for both VCM and PVC—then it will be possible to pass along most or all of the increase in input prices. The increase in VCM market prices will not actually increase the VCM costs of integrated firms, except that the opportunity cost of devoting VCM production to captive PVC output instead of VCM open market sales will increase. The cost of diverting VCM production in this fashion may be substantial, however, especially if no excess VCM capacity is available.

[212] If integrated producers have no incentive to compete away primary market price increases, then unintegrated primary market firms can be fairly sure that their integrated rivals will acquiesce in or support collusion by the unintegrated subset. In this situation, collusion is likely if the number of unintegrated firms is small, even if there are a large number of producers when the integrated firms are also counted. Hence, an acquisition that makes an integrated firm more likely to facilitate or passively accept collusion will increase the likelihood of collusion by unintegrated firms in the primary market. *See* Krattenmaker & Salop, *supra* note 210, at 262 (discussing "Frankenstein Monster").

[213] However, when downstream producers cannot substitute other inputs for the upstream product, when downstream production is characterized by constant returns to scale, and when downstream markets are competitive, a firm's incentive to collude in the upstream market will not depend upon its downstream market position. *See* White, *Antitrust and Video Markets: The Merger of Showtime and the Movie Channel As A Case Study*, in *Video Media Competition* (E. Noam ed. 1985) (significance of variable proportions production technology).

[214] Retaliation in the form of increased sales at reduced prices will be most feasible if the retaliating firms are operating along a horizontal section of their marginal cost curves. In that situation, there are no significant capacity constraints upon production increases. Because VCM producers are currently operating at an estimated 90 percent of practical production capacity (*see* page 93, *supra*), there is enough slack—approximately 10 percent of practical production capacity—to make effective retaliation feasible.

can infer that the integrated firms are cheating on the VCM cartel by lowering prices in the PVC market. Moreover, because VCM is such a standardized product, nonintegrated VCM producers are familiar with the cost functions of their integrated rivals, facilitating their ability to distinguish integrated firm cheating from price changes occasioned by changing cost conditions.

c. *The Effects of Vertical Integration Upon the VCM and PVC Markets.* Table VII describes the degree of integration by ownership into PVC production of VCM producers.[215] Prior to the acquisition, firms *not* integrated forward into PVC production controlled 46.9 percent of total VCM practical production capacity (4.165 billion pounds); integrated firms controlled the remaining 53.1 percent. Prior to the acquisition, firms *not* integrated backward into VCM production controlled 44.6 percent of total PVC practical production capacity (2.985 billion pounds); integrated firms controlled the remainder. Prior to the acquisition, Goodrich was the only integrated firm that controlled *less* VCM practical production capacity (930 million pounds) than PVC practical production capacity (1.192 billion pounds).[216] By contrast, Diamond controlled substantially *more* VCM capacity (1.070 billion pounds) than PVC capacity (602 million pounds). After the acquisition, five integrated producers (Diamond and Ethyl exited) accounted for 58.08 percent of total VCM practical production capacity, and 61.2 percent of total PVC practical production capacity. *See* Tables II and V, *supra.*

TABLE VII.—VERTICAL INTEGRATION JANUARY, 1982

Firm [217]	VCM practical production capacity	PVC practical production capacity
Dow	1.945 (1st)	—
Shell	1.385 (2nd)	—
Diamond Shamrock	1.070 (3rd)	0.602 (4th)
Ga. Pacific	1.000 (4th)	0.600 (5th)
Goodrich	0.930 (5th)	1.192 (1st)
PPG	0.835 (6th)	—
Conoco	0.650 (7th)	0.585 (6th)
Borden	0.472 (8th)	0.420 (8th)
Ethyl	0.300 (9th)	0.120 (12th)
Formosa	0.286 (10th)	0.196 (11th)
Tenneco Polymers	—	0.785 (2nd)
Shintech	—	0.720 (3rd)
Occidental Chemical	—	0.556 (7th)
Air Products	—	0.310 (9th)
CertainTeed	—	0.220 (9th)
Other	—	0.394
Total	8.873	6.700

[217] The listed firms are those that were producing VCM and/or PVC as of 1982. The capacity figures are expressed as billions of pounds. The data are derived from Table I and Table IV, *supra.*

The acquisition strengthened the incentives of VCM producers to collude, and improved their ability to enforce such a consensus. Prior to the transaction, Goodrich and Diamond were both vertically integrated producers, but Goodrich was a net VCM buyer—with less VCM capacity than PVC capacity—while Diamond was a net VCM seller—with more VCM capacity than PVC capacity.[218] As a result, Goodrich had a significant interest in somewhat lower VCM prices that conflicted to some degree—but did not override—its interest in higher PVC prices. After the acquisition, Goodrich controlled 23.7 percent of VCM practical production capacity (1.997 billion pounds), and 19.4 percent of PVC practical production capacity (1.34 billion pounds). The merged entity became a substantial net VCM *seller*—with greater VCM capacity than PVC capacity—to an even greater degree than Diamond has been before the acquisition.[219] By removing Goodrich as an integrated net buyer of VCM, and any incentive it might otherwise have had to secure lower VCM prices, the acquisition increased the incentive of the merged entity to collude in the VCM market, or at least to passively welcome collusion by the unintegrated VCM producers.[220] Removing Goodrich's incentive to thwart a collusive VCM price increase is of particular concern because there are only three unintegrated VCM firms. Coordinated action by the unintegrated VCM producers is therefore substantially more likely to occur.

In order the establish that vertical integration will not defeat collusion in the primary market, it is not enough, however, to establish that nonintegrated VCM producers have a strong incentive to collude and that integrated producers have an incentive to actively support or acquiesce in such a collusive effort. In addition, parcticipating firms must be able to enforce the terms of their collusive effort, and as a part of that effort must be able to monitor the conduct of their competitors. As the *DOJ Guidelines* indicate,

> [c]ollusive agreements are more likely to persist if participating firms can quickly detect and retaliate against deviations from the agreed prices or other conditions. Such deviations are easiest to detect, and therefore less likely to occur, in markets where detailed information about specific transactions or individual price or output levels is readily available to competitors.

DOJ Guidelines at ¶ 3.42.

The record evidence suggests that VCM producers could successfully enforce the terms of a collusive arrangement. Nonintegrated and integrated VCM producers can and do successfully monitor VCM market prices. Most VCM is sold pursuant to written long-term contracts at least one year in length.[221] Most such contracts permit the seller to reset the contract price over the contract term, and most of them also require the seller to provide notice of price increases a prescribed number of days in advance.[222] In some

[215] In this industry, the crucial stages of production are (a) the manufacture of ethylene dichloride from ethylene and chlorine, (b) its transformation into VCM, (c) the production of PVC resin, and (d) the fabrication of PVC-based industrial and consumer products. The fabrication stage includes the production of PVC compounds from PVC resins.

The significance of vertical integration for competition in the VCM and the PVC markets need only be evaluated with respect to integration by ownership. Respondents contend that the three unintegrated VCM producers have ceded control over major parts of their VCM capacity to unintegrated PVC producers through long term VCM supply contracts. RAB at 76–77; RPF 372 *in camera.* Although firms can transfer corporate control by contract short of integration by ownership, such a result would require the contractual allocation of the great majority of firm capacity. Functional integration is not created by long term contracts involving much smaller percentages of capacity. *Compare* RPF 371 *in camera with* RPF 374 *in camera.* Moreover, these contracts typically give the firms the cover independent discretion as to the quantities they will buy or sell, and their customers and sources of supply. *See* pages 21–22, *supra.*

[216] Because it takes 1.02 to 1.04 pounds of VCM to produce 1 pound of PVC resin (Disch, Tr. 643), VCM and PVC practical production capacities can be compared essentially on a one for one basis.

[218] In 1981, Goodrich produced 843.962 million pounds of PVC (16.1 percent of 5.242 billion pounds), and 774.728 million pounds of VCM (11.3 percent of 6.856 billion pounds). By contrast, Diamond produced 435 million pounds of PVC (8.3 percent of 5.242 billion), and 921.446 million pounds of VCM. *See* Tables I and IV, *supra.*

[219] In 1933, Goodrich produced 1.0368 billion pounds of PVC (18.4 percent of 5.635 billion pounds), and 1.5655 billion pounds of VCM (22.26 percent of 7.033 billion pounds). *See* Tables II and V, *supra.*

[220] Even if the PVC market were perfectly competitive, anticompetitive conduct in the VCM market could create power over price in the PVC market by in effect creating an involuntary PVC cartel: that is, by forcing all PVC producers to raise price in a coordinated fashion, whether or not a voluntary PVC cartel could have formed. *See generally* Salop and Scheffman, *infra* note 240. In other words, the increase in PVC prices requires a downward slopping *market* demand curve but not downward sloping *firm* demand curves.

[221] IDF 296 *in camera, citing* Taylor Tr. 1663–68; L. Wheeler, Tr. 958 *in camera;* IDF 305 *in camera, citing* Weber, Tr. 1839–40; Kienholz, Tr. 811–812; Taylor, Tr. 1592–93; Schaefer, Tr. 1145.

[222] IDF 296 *in camera, citing* Goodrich Admissions 507, 509; CX 4Z–40; IDF 300 *in camera, citing* Wheeler, Tr. 958–960 *in camera; CX 702; CX 705; CX 707; CX 735; CX 736; CX 739; IDF 317; Taylor, Tr. 1596.*

VCM contracts, the price to be charged in determined with reference to VCM prices charged by other firms in the VCM market.[223] Most VCM contracts also contain meeting competition clauses, pursuant to which a buyer that receives an offer of a lower price from a competing seller is obligated to report that price to the contracting seller and give the contracting seller an opportunity to match it.[224] Moreover, in VCM sales relationships not involving written contracts, buyers frequently permit current suppliers to meet competitive offers. IDF 298. These provisions—whether formally contractual or not—give VCM buyers a strong incentive to monitor industry transactions of price concessions, and increase the likelihood that whenever a seller offers a concession to a buyer, other sellers will discover it and retaliate. Industrywide use of the these clauses therefore discourages price reductions or other concessions in the VCM market.[225] As a result of these contractual provisions, VCM suppliers secure a considerable amount of price information through their customers. IDF 298, *citing* Kienholz, Tr. 810–811.

VCM suppliers also learn of competitive price changes through public announcements in the trade press.[226] In addition, many VCM sales are made pursuant to sales, tolling and exchange agreements between VCM competitors,[227] in part because integrated VCM sellers both buy and sell VCM. These agreements facilitate the exchange of price information among VCM producers.[228] In particular, because VCM contract prices are frequently subject to negotiation based upon changes in market prices, sales, tolling, and exchange agreements between VCM sellers create a forum for discussing industry prices. For example, one Goodrich document indicates that an employee of a competing VCM seller called in late 1982 "to discuss the average VCM prices now prevailing in the marketplace * * *" CX 217C *in camera.*

As a consequence of the wide availability of price information, particularly through meeting competition clauses and supply interrelationships, VCM firms are generally able to secure relatively reliable and accurate VCM price information.[229] Hence, for example, a number of VCM sellers were familiar with the terms of a specific VCM supply contract between Dow and Air Products.[230] Furthermore, VCM producers monitor the market shares, capacity, and changes in capacity of their VCM competitors.[231]

It is conceivable in some industries that purchasing firms will recognize that meeting competition clauses may facilitate seller collusion, and will therefore prefer to switch suppliers—in response to offers of lower prices from rivals—rather than report the offers to existing suppliers. Such conduct is unlikely in the VCM market, primarily because it is costly to switch from one supplier to another. VCM is a highly volatile gaseous chemical. Approximately 50 percent of the VCM sold in the United States is transported by pipeline from suppliers' plants to their customers' premises.[232] Pipeline transportation is cheaper and safer than transportation by barge or tank car.[233] As a result, once such a pipeline is in place, the cost savings it produces make it highly unlikely that a VCM customer will switch to another supplier.[234] The record evidence also establishes that non-pipeline customer/supplier relationships tend to be stable over time.[235] In short, most VCM buyers prefer to stay with their current suppliers.[236] Thus, most VCM buyers will report offers of lower prices to their current suppliers so that they can match them. In conjunction with the supply interrelationships described above, the active assistance of VCM purchasers permits VCM producers easily to detect cheating on *external* VCM prices in the open VCM market by competing VCM producers—whether integrated or not.

Both integrated and nonintegrated VCM producers can also monitor cheating by integrated VCM producers—with respect to *internal* VCM "prices"—by observing the prices of PVC. Because they are intimately familiar with both VCM and PVC production processes, and are participants in both the PVC and VCM markets, integrated firms can easily detect cheating with respect to either VCM or PVC prices by their rivals. Nonintegrated VCM producers can rely upon their customers to quickly detect and report PVC price reductions.[237] As noted *supra*, most PVC is sold pursuant to long term contractual or "handshake" relationships that typically contemplate price and output changes on a monthly basis.[238] These arrangements almost invariably provide—either expressly or implicitly—that PVC purchasers are to notify their suppliers of offers of lower prices by competing suppliers, and are to give their suppliers an opportunity to match those prices.[239] In addition, suppliers are aware of other suppliers' prices because they frequently exchange or toll PVC with one another. CPF 7.15. PVC suppliers are very likely, in turn, to report any PVC price reductions to their VCM suppliers.

Additional upstream or downstream integration on the part of any of these producers might make price and output monitoring somewhat more difficult. However, that does not appear to be the case in this industry. On the upstream side, integration into chlorine production is unlikely to complicate monitoring. In 1983, firms accounting for 80 percent of total VCM practical production capacity were integrated backward into chlorine production; only Borden, Shell and Conoco were not so integrated. RX 246. On the downstream side, it is true that most PVC resin producers have some facilities for compounding and/or fabricating PVC. However, respondents have adduced no evidence indicating that these facilities together account for more than a small proportion of total PVC resin.

In short, both integrated and nonintegrated VCM producers have

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[223] IDF 297 *in camera, citing* Schaefer, Tr. 1223 *in camera;* CX 88X–Y *in camera.*

[224] IDF 296 *in camera, citing* Wheeler, Tr. 958–960 *in camera;* CX 88X–Y *in camera;* IDF 317; Kienholz, Tr. 811–813; *see* Taylor, Tr. 1596–97.

[225] *See* Kienholz, Tr. 811; *see also* Schaefer, CX 295Z30 *in camera; see generally United States v. FMC Corp.*, 306 F. Supp. 1106, 1112 (E.D. Pa. 1969); Salop, *supra* note 58 at 27–30; Clark, *supra* note 58 At 934–935.

[226] IDF 299, *citing* CX 736; CX 737; CX 739.

[227] L. Wheeler, Tr. 972–75 *in camera;* CX 555Z11 *in camera.*

[228] IDF 301 *in camera, citing* DiLiddo, Tr. 3295 *in camera*, Tr. 3299; CX 88 *in camera;* CX 24 *in camera;* CX 26 *in camera;* CX 206A; CX 208; CX 212; CX213; CX 214; CX 215; CX 217 *in camera.*

[229] IDF 302, *citing* Diamond Admission 535; CX 6V, Z67.

[230] IDF 303, *citing* Kienholz, Tr. 853–56; H. Wheeler, Tr. 1020–24 *in camera;* Schaefer, Tr. 1193–95; DiLiddo, Tr. 3306–09.

[231] IDF 304, *citing* Diamond Admission 523; CX 6V, Z–66; CX 169F; CX 971 *in camera;* CX 146; CX 215; CX 238E; CX 425.

[232] IDF 307, *citing* H. Wheeler, Tr. 989; Taylor, Tr. 1564.

[233] IDF 307, *citing* Kienholz, Tr. 756, 759–60; 789; L. Wheeler, Tr. 980–981; Taylor, Tr. 1563–64; Schaefer, Tr. 1129.

[234] IDF 307, *citing* Kienholz, Tr. 787–88, 790, 868–70; Taylor, Tr. 1566–67.

[235] IDF 308 *in camera, citing* Kaserman, Tr. 2500; Schaefer, Tr. 1145; CX 523T *in camera;* CX 419.

[236] IDF 306 *in camera, citing* Taylor, Tr. 1567–68; Schaefer, Tr. 1145.

[237] As noted *supra*, the fact that integrated producers account for a large percentage of PVC market sales makes it more likely that nonintegrated PVC producers will receive PVC price information concerning integrated producers quickly.

[238] IDF 211 *in camera;* IDF 219 *in camera;* Disch, Tr. 685.

[239] IDF 211 *in camera*, 237 *in camera;* Disch, Tr. 684; DiLiddo, Tr. 3254–55, Weber Tr. 1789–90. PVC buyers are very likely to report such offers to their suppliers because it is costly to switch suppliers, and they will therefore prefer to remain with their current suppliers. *See* page 88 and note 202, *supra.*

strong incentives to create and maintain a collusive arrangement, and can readily detect cheating from that arrangement and retaliate accordingly. In reaching this conclusion, it is important to emphasize and summarize the mechanism through which VCM producers could collude successfully. They collectively control an input that is essential to PVC production; that is highly homogeneous; that has a low price elasticity of demand; and that can be produced pursuant to a standardized technology available to all incumbent producers. In particular, the demand for PVC is sufficiently inelastic to make it likely that an increase in VCM prices can profitably be passed along to PVC customers. Anticompetitive conduct in the VCM market that raises the VCM price to all PVC producers will shift the supply curve of each downstream firm upward, and thereby increase the equilibrium price of PVC, because the demand curve for PVC is downward sloping.[240] This will occur even if the PVC market is perfectly competitive (and the record evidence does not in any event support that view).[241]

As a result, VCM producers can effectively manage a collusive arrangement not only within the VCM market, but within the PVC market as well. This is true despite the fact that it would be difficult to collude successfully in the PVC market alone, for the reasons summarized below. It is therefore incorrect to argue, as the respondents do, that it is impossible to collude in the VCM market because it is impossible to collude in the PVC market. It is rather possible for VCM producers to create and maintain a collusive arrangement in the PVC market, notwithstanding some of its structural characteristics, because it is possible to create and maintain a collusive arrangement in the VCM market.

D. Conclusion

1. PVC Market

The HHIs and four-firm concentration ratios for the PVC market after the acquisition were just barely high enough to surpass the thresholds specified in earlier Supreme Court and Commission cases, as well as the thresholds at the lower end of the "moderately concentrated" range of the *DOJ Guidelines*. The concentration levels therefore create only a weak presumption of anticompetitive effects from the acquisition in the PVC market. We are persuaded that the structural evidence, on balance, rebuts this weak presumption and establishes that the acquisition is unlikely to lessen competition substantially in the PVC market, for three reasons. First, PVC resin is relatively heterogeneous. Several grades of PVC resin are needed for different end use applications, different PVC producers manufacture different amounts of each grade, and an effective collusive strategy would require reaching an agreement on price and output levels for each grade. Moreover, even within any particular PVC resin grade, quality varies from one PVC producer to another, making effective collusion even more difficult.

Second, costs vary significantly from one firm to another, primarily because different firms' operating costs vary as a function of the use of large and small reactors, and the fact that different firms emphasize the production of different PVC resin grades. Transportation cost differences represent an additional complicating factor. Third, although the price elasticity of demand for PVC is, on balance, relatively low, an effort on the part of PVC producers to raise PVC prices to supracompetitive levels may be constrained to some degree by the higher price elasticity of demand for many PVC end use products, and made more difficult by variations in price elasticity from one PVC end product to another.[242]

2. VCM Market

The record evidence indicates that the HHIs and four-firm concentration ratios for the VCM market after the acquisition lay well above the concentration levels specified in earlier Supreme Court and Commission cases, and reached the upper end of the "moderately concentrated" range in the *DOJ Guidelines*. Moreover, the acquisition increased three different measures of HHI levels by 226 to 304 points. The concentration levels therefore create a relatively strong presumption that the acquisition substantially lessened competition in the VCM market.

The structural factors in the VCM market described above strengthen rather than rebut this presumption. First, impediments and one barrier to entry into the VCM market are sufficiently high to permit incumbent firms with market power to sustain supracompetitive prices for several years. Second, VCM is a highly homogeneous product; only one grade is used to produce PVC resin. Third, the price elasticity of demand for VCM is very low. Fourth, cost functions and raw materials and transportation costs do not differ significantly from one VCM producer to another. Fifth, the size and distribution of VCM buyers are not likely to constrain the pricing discretion of VCM producers. Sixth, although contracts in the VCM market typically cover at least one year, prices and output levels are renegotiated frequently—pursuant to both contractual and "handshake" relationships—and meeting competition clauses in the contracts keep sellers informed of the pricing behavior of their rivals. Seventh, although some excess capacity confronted VCM producers during the recession, capacity utilization levels have now approached their pre-recession levels, and most experts expect any remaining disparity to disappear completely by the 1990's. Demand is expected to grow at a relatively healthy annual rate of 3 to 4 percent. As a result, capacity utilization levels are likely to remain well above the 80 percent "break even" level for the foreseeable future. Supply conditions are also likely to remain stable. Finally, vertical integration between VCM and PVC producers is likely to facilitate efforts to collude in the VCM market. These factors strengthen the conclusion that the acquisition is likely to substantially lessen competition in the VCM market.

V. Performance Factors

An important part of the respondents' defense to the allegations in the complaint in this matter is summarized in their answering brief:

Throughout these proceedings an undeniable truth has stymied complaint counsel: the PVC industry was intensely

[240] This is true because, as noted *supra*, all current and potential PVC producers need VCM as an input. *See generally* Krattenmaker & Salop, *supra* note 210; Salop and Scheffman, *Raising Rivals' Costs*, 73 Am. Econ. Rev 267 (1983). *Compare DOJ Vertical Restraints Guidelines* ¶3.21 (facilitating collusion).

[241] Even if the PVC market were perfectly competitive, anticompetitive conduct in the VCM market could create power over price in the PVC market by in effect creating an involuntary PVC cartel; that is, by forcing all PVC producers to raise price in a coordinated fashion, whether or not a voluntary PVC cartel could have formed. *See generally* Salop and Scheffman, *supra* note 240. In other words, the increase in PVC prices requires a downward sloping *market* demand curve but not downward sloping *firm* demand curves.

[242] Commissioner Azcuenaga points out that because the price elasticity of demand for PVC is relatively low, PVC producers—as well as VCM producers—"could pass on a collusive PVC price increase." *Azcuenaga Opinion* at 15. That in fact is an important reason why *VCM* producers could collude successfully. *See* pages 110–111, *supra*. However, the fact that *PVC* producers *could* pass on a cost increase does not mean that they will be able to determine and maintain a set of consensus prices, in light of the heterogeneity of PVC resins, and cost differences from one PVC producer to another.

competitive before The BF Goodrich Company (Goodrich) acquired one polyvinyl chloride (PVC) plant and one vinyl chloride monomer (VCM) plant from Diamond Shamrock Chemicals Company (Diamond) in January 1982 and has been intensely competitive since the acquisition.

RAB at 1. Respondents recognize that a finding of actual anticompetitive effects is not needed to establish that the acquisition violates section 7 of the Clayton Act (*id.* at 2); establishing that the acquisition may substantially lessen competition is sufficient. However, respondents argue that actual post-acquisition evidence of industry performance is sufficient to rebut other evidence satisfying the latter standard. *Id.* at 3–8.

The Commission has concluded that the respondents' performance evidence does not rebut its finding of liability in the VCM market. Post-acquisition performance evidence must be evaluated very carefully, because of its potential for manipulation. Much of the record evidence of competition respondents adduce is not persuasive, particularly with respect to the VCM market. Moreover, there is no guarantee that the limited price competition that respondents have identified will continue now that demand and supply conditions in both the VCM and the PVC markets have improved. Furthermore, whatever probative value respondents' post-acquisition performance evidence might have is outweighed by the probative value of the post-acquisition structural evidence in the record.

The Supreme Court has determined that post-acquisition evidence tending to diminish the probability or impact of anticompetitive effects might be considered in a § 7 case.[243]

However, in making that determination, the Court has noted that the "probative value" of such evidence is "extremely limited." As the Court observed:

If a demonstration that no anticompetitive effects had occurred at the time of trial or of judgment constituted a permissible defense to a § 7 divestiture suit, violators could stave off such actions merely by refraining from aggressive or anticompetitive behavior when such a suit was threatened or pending.[244]

The Seventh Circuit has more recently confirmed that "[p]ost acquisition evidence that is subject to manipulation by the party seeking to use it is entitled to little or no weight." [245] Similarly, the Commission has determined that it is inappropriate to consider "exculpatory post-acquisition evidence of voluntary actions by the acquiring firm" in determining the legality of an acquisition.[246] For similar reasons, the conclusory testimony of industry executives to the effect that their industry is "competitive" is not particularly useful and cannot be given much weight.[247] The probative value of performance evidence is also limited by its susceptibility to transitory economic conditions, such as a recession. For example, the fact that profits are low in an industry with excess capacity does not necessarily mean that industry pricing is competitive.[248] Furthermore, the absence of "concrete anticompetitive symptoms" does not mean that

competition has not already been affected, "for once the two companies are united no one knows what the fate of the acquired company and its competitors would have been but for the merger." [249]

Recent Commission decisions have carefully followed these principles in evaluating post-acquisition performance evidence. In *Champion Spark Plug*, in evaluating a potential competition case, Judge Timony considered evidence suggesting that the acquired firm had been suffering from low and declining profits, but only in conjunction with structural evidence showing that (1) its share of the relevant market had declined from 45.1 percent to 34.3 percent during the same period; and (2) entry barriers were low, and seven new firms had recently entered the relevant market.[250] Similarly, in *BASF Wyandotte Corp.*, another potential competition case, Judge Hyun relied heavily upon structural evidence that "entry of new firms" was unimpeded; small firms in the relevant market were growing rapidly; and the acquisition eliminated only *de minimis* potential competition.[251]

Still more recently, the Commission has confirmed that the presence of some degree of competition does not necessarily refute the inference of the likelihood of anticompetitive effects created by relevant structural and behavioral evidence. In *HCA*, the Commission stated:

It is true that the undisputed evidence shows that more vigorous competition, including more direct price competition, is emerging in the health care industry, but it is a fallacy to conclude that growing competition in health care markets means that these acquisitions pose no threat to that competition. In fact, it is just that emerging competition that must be protected from mergers that facilitate the suppression of such competition.[252]

Similarly, the *DOJ Guidelines* advise that "[t]he fact that the market is currently competitive casts little light on the likely effect of the merger." *DOJ Guidelines* at ¶ 3.45.

A. PVC Market

Judge Howder concluded with respondents that the PVC industry performed in a relatively competitive fashion prior to the acquisition, and has continued to perform in that fashion since the acquisition. For example, Judge Howder noted that in a 1982 document, Goodrich informed its sales people that the

PVC industry is not healthy. Red ink continues to flow.[253]

Respondents similarly maintain that during the recession, the PVC market suffered from "substantial excess capacity and poor financial returns" (RPF 353 *in camera*), and that profits in the PVC industry have been poor since the acquisition.[254] A number of industry witnesses testified that the PVC industry is highly competitive. IDF 248.

Two factors limit the probative value of this evidence. First, repondents' basis for their conclusion that the PVC industry is competitive is for the most part simply the testimony of industry

[243] *United States v. General Dynamics Corp.*, 415 U.S. 486, 504 (1974), *citing FTC v. Consolidated Foods Corp.*, 380 U.S. 592, 598 (1965); *United States v. E.I. du Pont de Nemours & Co.*, 353 U.S. 586, 597 *et seq.*, 602 *et seq.* (1957); *United States v. Continental Can Co.*, 378 U.S. 441, 463 (1964); *accord, Weyerhaeuser Co.*, 106 F.T.C. at 284 n.59.

[244] *United States v. General Dynamics Corp.*, 415 U.S. at 504–05.

[245] *HCA v. FTC*, 807 F.2d at 1384, *citing Lektro-Vend Corp. v. Vendo Co.*, 660 F.2d 255, 276 (7th Cir. 1981).

[246] *HCA*, 106 F.T.C. at 486 n.17.

[247] *British Oxygen Co.*, 86 F.T.C. 1241, 1365 n.26 (1975), *rev'd and remanded on other grounds sub nom. BOC International Ltd. v. FTC*, 557 F.2d 24 (2d Cir. 1977); *see also United States v. Philadelphia National Bank*, 374 U.S. at 366–67.

[248] Klass, Tr. 5725–27; Kaserman, Tr. 2446–48. An additional complication is that the accounting profit data usually available from industry firms is much less accurate measure of industry performance than economic profits data, and frequently diverges quite significantly from economic profit data. *B.A.T. Industries, Ltd.*, 104 F.T.C. 852 (1984).

[249] *United States v. General Dynamics Corp.*, 415 U.S. at 505, *quoting FTC v. Consolidated Foods Corp.*, 380 U.S. at 598.

[250] *Champion Spark Plug*, 103 F.T.C. 546, 628–30 (1984). The Commission adopted Judge Timony's decision and order as its own. *Id.* at 639–40.

[251] *BASF Wyandotte Corp.*, 100 F.T.C. 261, 428–429 (1982).

[252] *HCA*, 106 F.T.C. at 501–02.

[253] IDF 247 *in camera*, *quoting* RX 186F *in camera*.

[254] RPF 355 *in camera*, *citing* CX 527; CX 186F; RX 132C; RX 7160; Disch, Tr. 706–07; H. Wheeler, Tr. 1736; DiLiddo, Tr. 3250, 3419.

representatives. Industry executives, well aware of the antitrust laws, are unlikely to testify otherwise. Second, much if not all of the "excess capacity and poor financial returns" respondents identify is probably attributable to the 1982 recession. *See* IDF 74. There is no guarantee that the price competition that respondents have identified will continue, now that industry demand is expanding again, and PVC producers are once again operating at relatively high capacity levels. *See* IDF 75.

We need not evaluate respondents' performance evidence for the PVC market in any greater detail, however, because we have concluded that the acquisition is not likely to lessen competition substantially in the PVC market.

B. VCM Market

Respondents similarly argue that the VCM market is "highly competitive," and that the VCM business has been characterized by intense competitive pricing, and "has been unprofitable in the recent past." [255] However, respondents' performance evidence does not rebut the Commission's finding of liability in the VCM market, for three reasons. First, respondents' primary basis for these conclusions is the generalized testimony of VCM industry representatives that the industry is competitive and the acquisition "did not enhance the likelihood of anticompetitive behavior." RPF 460–66 *in camera*. Given the interest of industry participants in establishing that their industry is highly competitive, this sort of generalized testimony is not particularly probative.

Second, the dramatic effects of the recession make it difficult to reply upon respondents' performance evidence, because the business downturn probably would have forced even a monopolist to reduce prices. There is no guarantee that the limited competition that respondents assert exists will continue now that demand conditions have improved substantially. Evidence from earlier periods suggests that the recession probably had only transitory effects on price and profit levels. For example, a 1977 Goodrich document states:

> The market conditions are such that the suppliers of EDC [ethylene dichloride] and VCM are in a strong position to control the price and terms under which these materials are purchased.

CX 17Z14 *in camera*. Similarly, a 1978 Occidental document complains about "[s]trong marketplace discipline by the VCM producers." CX 524V *in camera*. And a 1980 Firestone document concludes that

> the Company's monomer [VCM] suppliers were able to demand prices resulting in high profits for themselves regardless of the conditions of the polymer market upon which the Plastics Division was dependent for its profit.

CX 503B.

Third, the post-acquisition structural evidence makes respondents' post-acquisition performance evidence less persuasive. Since the acquisition, the number of firms in the VCM market has declined from eleven to nine; the HHI for nameplate capacity has increased from 1529 to 1632 as of January 1985; and practical production capacity has increased from 1552 to 1650.[256] For these reasons, respondents' performance evidence does not rebut the presumption of anticompetitive effects drawn from the structural data.

VI. Relief

The attached Final Order is designed to remedy the anticompetitive effects arising from the acquisition. More particularly, Paragraph II of the Order directs Goodrich to divest the VCM Plant located at La Porte, Texas—together with associated assets, rights and privileges secured from Diamond, and all additions and improvements added by Goodrich—within one year of the effective date of the Order. Divestiture is to be made subject to the prior approval of the Commission. Paragraph III requires Goodrich to provide the acquirer with technology relating to the plant, and to provide VCM know-how for a period of one year. These requirements are reasonably related to ensuring that the La Porte VCM Plant is reestablished as a viable competitive entity.[257] Paragraph IV requires Goodrich to assign all sales and supply contracts for the plant to the acquirer. Paragraph V provides for the appointment of a trustee to divest the plant if Goodrich fails to comply with the divestiture requirements.

Paragraph VI prohibits Diamond from interfering with the relief the order prescribes, and for a period of five years requires Diamond to continue to provide utilities and other support services previously provided to the La Porte VCM Plant, and to afford the plant continued access to and use of the pipelines connected to the plant. Paragraph VII requires Goodrich—for a ten-year period—to secure Commission approval prior to making certain acquisitions of VCM manufacturing assets in the United States. Paragraph IX provides in particular that prior Commission approval is required prior to retransfer of the VCM plant from Goodrich to Diamond, and—for a period of three years—prior to its divestiture by Diamond to a third party. Finally, Paragraphs VIII, X, and XI impose notification and reporting requirements upon both respondents.

The relief embodied in the order is reasonably related to the violation of section 7 of the Clayton Act that the Commission has identified. In section 7 cases, the principal purpose of relief "is to restore competition to the state in which it existed prior to, and would have continued to exist but for, the illegal merger."[258] In this case, divestiture of the La Porte VCM plant represents the most effective means of achieving that objective.[259] As long as Goodrich continues to operate the La Porte VCM Plant, the anticompetitive effects identified *supra* will persist. For similar reasons, the Commission directed the divestiture of the acquired assets in *AMI* and *HCA*.[260]

A ten-year prior approval provision is warranted in this case with respect to Goodrich because of the structural characteristics of the VCM market. If Goodrich divests the La Porte VCM Plant to a firm not currently in the United States VCM market—the divestiture that would reduce market concentration most significantly—the HHI for nameplate capacity would fall to approximately 1350. *See* Table V, *supra*. Without the La Porte VCM Plant, Goodrich will own one VCM plant—located at Calvert City, Kentucky—with a nameplate capacity of one billion pounds. *See* page 5, *supra*. In 1984, this represented approximately 11 percent of total domestic VCM nameplate capacity. If Goodrich were then to acquire the smallest domestic VCM producer—and in 1984 that was Conoco (now Vista),

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[255] RPF 460–463 *in camera*, *citing* RX 428E *in camera*; Disch (Tenneco), Tr. 697–99; Kienholz (PPG), Tr. 849–50; L. Wheeler (Shell), Tr. 991, 1025, 1051; Taylor (Dow), Tr. 1672; H. Wheeler (GenCorp), Tr. 1766–67; DiLiddo (Goodrich), Tr. 3327.

[256] *See* pages 58–61, *supra*; IDF 266.

[257] *See, e.g., Kaiser Alum. & Chem. Corp.*, 93 F.T.C. 764, 855–58 (1979), *remanded on other grounds*, 652 F.2d 1324 (7th Cir. 1981); *Ekco Products Co.*, 65 F.T.C. 1163, 1212–15 (1964), *aff'd*, 347 F.2d 745 (7th Cir. 1965).

[258] *RSR Corp.*, 88 F.T.C. 800, 893 (1976), *aff'd*, 602 F.2d 1317 (9th Cir. 1979), *cert. denied*, 445 U.S. 927 (1980); *see Brunswick Corp.*, 96 F.T.C. 151, 155 (1980), *aff'd sub nom. Yamaha Motor Co., Ltd. v. FTC*, 657 F.2d 971 (8th Cir. 1981), *cert. denied*, 456 U.S. 915 (1982).

[259] *See Ford Motor Co. v. United States*, 405 U.S. 562, 573 (1972); *HCA*, 106 F.T.C. at 513; *AMI*, 104 F.T.C. at 221; *RSR Corp.*, 88 F.T.C. at 893.

[260] *HCA, 106 F.T.C. at 513; AMI*, 104 F.T.C. at 226–27.

with a nameplate capacity of 6.78 percent (*see* Table V, *supra*)—its share would rise to 17.78 percent, and the relevant HHI for nameplate capacity would increase by approximately 150 points, to 1500. Such an acquisition would almost certainly violate section 7 of the Clayton Act, for essentially the same reasons that Goodrich's acquisition of the La Porte VCM plant constitutes a violation of section 7. As the Commission has previously indicated, "it is industry market structure and market conditions * * * that determine the appropriateness of imposing a prior approval requirement in a section 7 case." [261] Here, the prospect that *any* acquisition by Goodrich of any firm in the United States VCM market would almost certainly violate section 7 warrants the prior approval requirement.

Several factors make it essential to require Diamond to comply with certain provisions of the order. Pursuant to the Goodrich/Diamond purchase agreement, a Commission order requiring Goodrich to divest the La Porte VCM plant will permit Goodrich to require Diamond to reacquire the plant. CX3Z505–Z507, cl. 4 *in camera*. The agreement also gives Diamond a right of first refusal to purchase the stock or assets of DSPC, including the La Porte VCM plant, in the event of a divestiture order. *Id.* Diamond has indicated that if it were required to reacquire the assets it sold to Goodrich, it would operate them "only until [it] could resell the assets to someone who is committed to being in the plastics business * * *" [262] Because the La Porte plant is approximately the same size as Goodrich's Calvert City VCM plant, its conveyance to any firm in the VCM market would raise concerns similar to those that would be attributable to any other acquisition by Goodrich in that market. The order therefore requires prior Commission approval of any subsequent divestiture of the La Porte plant by Diamond within three years after Diamond reacquires the plant. The order also prohibits Diamond from interfering with the divestiture because, through its right of first refusal, Diamond could theoretically prevent Goodrich from divesting the La Porte VCM plant to another buyer.[263] Order provisions of this sort—directed against the seller in an acquisition that violates section 7 of the Clayton Act—may be imposed when necessary to implement effective relief.[264]

The Commission believes that the foregoing order provisions lie well within its authority. The general standard is that "the courts will not intervene [with a Commission order] except where the remedy selected has no reasonable relation to the unlawful practices found to exist." [265] Once "the government has successfully borne the considerable burden of establishing a violation of law, all doubts as to the remedy are to be resolved in its favor." [266]

VII. Conclusion

A. PVC Market

The Commission has determined to affirm the decision of Judge Howder with respect to the PVC market. Environmental restrictions have created higher costs for new entrants and expansion than confronted incumbent capacity, and thus constitute a barrier to entry sufficiently substantial to make collusion within the PVC market feasible.[267] However, other structural factors establish that, on balance, the acquisition is not likely to have anticompetitive effects in the PVC market. The acquisition increased market HHIs to only 1098 for nameplate capacity, 1079 for practical production capacity, and an estimated 1020 for actual production levels. *See* pages 54–55, *supra*. As we noted *supra*, these post-acquisition concentration data are only barely sufficient to create a presumption of anticompetitive effects in the PVC market. Because they fall within the lower end of the mid-range of the Department of Justice Merger Guidelines, the Commission must carefully evaluate a number of other industry characteristics in order to determine whether the acquisition may in fact substantially lessen competition. [268]

On balance, other industry characteristics refute the weak presumption of anticompetitive effects in the PVC market created by the concentration data. First, PVC is relatively heterogeneous. Second, costs vary significantly from one PVC producer to another, as a consequence of differing reactor sizes, resin production emphases, and transportation costs. Third, the higher price elasticity of demand for some PVC end products may constrain any effort among PVC producers to collude. These industry characteristics make it unlikely that the acquisition had any anticompetitive effects in the PVC market.

B. VCM Market

The Commission has determined to reverse the decision of Judge Howder with respect to the VCM market. Environmental restrictions that create higher costs for new entrants and expansion than confronted incumbent capacity constitute a barrier to entry. Moreover, the substantial time required to enter, the need to capture a substantial share of industry sales in order to achieve minimum economies of scale, and the sunk character of an entry investment constitute impediments to entry. These contraints are sufficiently substantial to make collusion within the VCM market feasible.[269] Moreover, the acquisition substantially increased concentration in the VCM market: by 226 points to 1529 for nameplate capacity; by 253 points to 1552 for practical production capacity; and by 304 points to 1663 for actual production levels. *See* page 61, *supra*. The acquisition raised four-firm concentration levels to 70.8 percent for nameplate capacity, 71.3 percent for practical production capacity, and 72.59 percent for actual production levels. *See* Table V, *supra*. These concentration data create a relatively strong presumption of anticompetitive effects.[270]

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[261] *HCA*, 106 F.T.C. at 514; *accord*, *AMI*, 104 F.T.C. at 221–227.

[262] Diamond Shamrock Chemicals Company Motion for Dismissal and Supporting Argument (Aug. 31, 1984), at 12.

[263] If Diamond has accurately portrayed its disinterest in reacquiring the plant, then it is unlikely, however, to interfere with the sale of the plant to another party.

[264] *See Dean Foods Co.*, 70 F.T.C. 1146, 1293–94 (1966), *modified as to order*, 71 F.T.C. 731 (1967); *see also United States v. Coca Cola*, 575 F.2d 222, 227–31 (9th Cir.), *cert. denied*, 439 U.S. 959 (1978) (sellers may be included in section 7 remedies). There is thus no need to address complaint counsel's alternative argument (*see* CAB at 71) that the agreement to "dismantle" DSPC violated section 5 of the Federal Trade Commission Act.

[265] *Jacob Siegel Co. v. FTC*, 327 U.S. 608, 613 (1946); *accord, e.g., HCA v. FTC*, 807 F.2d at 1393.

[266] *United States v. E.I. DuPont de Nemours & Co.*, 366 U.S. 316, 334 (1961).

[267] *E.g., FTC v. Warner Communications, Inc.*, 742 F. 2d 1156, 1163–64 (9th Cir. 1984); *Marathon Oil Corp. v. Mobil Corp.*, 669 F. 2d 378, 380–81 (6th Cir. 1981); *See Weyerhaeuser Co.*, 106 F.T.C. at 287.

[268] *Weyerhaeuser Co.*, 106 F.T.C. at 280.

[269] *E.g., FTC v. Warner Communications, Inc.*, 742 F. 2d 1156, 1163–64 (9th Cir. 1984); *Marathon Oil Corp. v. Mobil Corp.*, 669 F. 2d 378,380–81 (6th Cir. 1981); *see Weyerhaeuser Co.*, 106 F.T.C. at 287.

[270] *E.g., United States v. Philadelphia National Bank*, 374 U.S. 321, 363 (1963) (increased C_4 to 78 percent); *United States v. Waste Management, Inc.*, 743 F. 2d 976, 981 (increased C_4 to 67.1 percent); *FTC v. Warner Communications, Inc.*, 742 F. 2d 1156, 1163 (9th Cir. 1984) (increased C_4 to 75 percent); *Weyerhaeuser Co., 106 F.T.C. at 279 (increased C_4* to 57.8 percent); *Grand Union Co.*, 102 F.T.C. at 1056–58 (increased C_4 in thirteen markets to levels ranging from 49 percent to 72 percent) (*dictum*).

The other structural evidence in the record strengthens this presumption. First, a low price elasticity of demand strengthens that inference,[271] and the record evidence establishes that the price elasticity of demand for VCM is low. Second, VCM is a highly homogeneous product, with few if any differences from one firm to another. Third, cost functions for producing VCM are relatively similar from one firm to another. Fourth, the number and size of VCM buyers are not likely to constrain the pricing discretion of VCM producers. Fifth, the frequency, size and public character of VCM transactions are not likely to complicate collusive efforts. Sixth, demand and supply conditions in the VCM market are likely to remain relatively stable over the next few years. Seventh, vertical integration between VCM and PVC producers facilitates efforts to collude in the VCM market.

The foregoing structural factors strengthen the presumption that the acquisition is likely to have anticompetitive effects in the VCM market. The generalized and self-serving testimony of industry members that the industry is competitive does not rebut the strong evidence that the acquisition is likely to have anticompetitive effects. The attached order will remedy the anticompetitive effects of the acquisition by requiring Goodrich to divest the VCM plant it acquired from Diamond.

Issued: March 15, 1988.

CHAIRMAN OLIVER, CONCURRING IN PART AND DISSENTING IN PART

I. Introduction

I concur with the majority in its determination that "the acquisition is not likely to have anticompetitive effects in the PVC market." Although PVC appears to define a relevant antitrust market, a PVC conspiracy is unlikely because, *inter alia*, the PVC market is relatively unconcentrated, PVC is heterogeneous, production cost functions vary from one PVC producer to another, and successful monitoring would necessarily extend to the market for PVC products. Moreover, the acquisition does nothing that would substantially increase the likelihood of a PVC conspiracy.[1] However, I disagree with the majority's conclusion that the Goodrich acquisition may substantially lessen competition by creating an appreciably increased danger of collusion in the VCM market, and would affirm the Administrative Law Judge's order dismissing the case.

The VCM and PVC markets are closely related. PVC can be produced only from VCM, and almost all VCM is used to produce PVC. VCM produced and used by integrated firms is internally produced, internally shipped (often by pipeline) and internally priced. Because some VCM producers are integrated downstream into PVC production and others are not, there are basically three different groups that would be directly affected by collusion in either of these markets. First, there are the integrated VCM/PVC producers.[2] Approximately one half of VCM and PVC production comes from this group. Second, some firms produce only VCM for sale (nonintegrated VCM producers.[3] Third, there are nonintegrated PVC producers that must have a supply of VCM in order to operate.[4]

Tacit collusion in the VCM market would be difficult to achieve or maintain for several reasons. First, the incentives of the two groups of VCM producers in that market, integrated and nonintegrated firms differ materially, despite the majority's assumptions to the contrary.[5] The integrated VCM/PVC producers have a common interest in undercutting the PVC sales of the nonintegrated PVC producers which, if successful, would also erode any cartel price tacitly agreed on by the nonintegrated VCM producers. Second, collusion is only possible where price or output restrictions can be effectively monitored. For a VCM conspiracy to be successful in this case, all participants would have to be assured that the others were not cheating on the cartel price. However, the quantity of VCM produced and used by integrated firms cannot be directly observed by other firms. Levels of VCM output from integrated firms may only be monitored indirectly, from the sales of PVC resins and other PVC end products that the integrated firms market. But many of the same factors that make collusion difficult in the PVC market are also present in the VCM market, making the efforts of the nonintegrated VCM producers to monitor the integrated VCM PVC/VCM producers in their sales of PVC sufficiently difficult to defeat an attempt to cartelize the VCM market.

In evaluating whether a merger may substantially lessen competition,we necessarily attempt to make a prediction of the potential for certain future conduct. We need not achieve complete certainty in this predictive process, but unless we have a plausible theory and credible evidence explaining why a merger is likely to increase substantially the risk of collusion (or the degree of effective collusion) we have no basis under section 7 of the Clayton Act to find the merger illegal. Lacking any theory or evidence apart from somewhat increased levels of concentration, we have no basis for reversing the ALJ's holding that the acquisition is not likely to substantially lessen competition.

II. Incentives of Integrated and Nonintegrated Firms to Collude

The majority opinion concedes that an effective collusive strategy to obtain supracompetitive prices in the VCM market would require the participation of both the integrated VCM/PVC producers and the nonintegrated VCM producers.[6] The majority recognizes, however, that the nonintegrated VCM firms are at a disadvantage in reaching and enforcing tacit collusion because they cannot directly monitor the output or price of VCM that is internally consumed by the integrated VCM/PVC producers.[7] As a result, the majority opinion suggests that the nonintegrated VCM producers "can rely on the integrated firms as a group to monitor their integrated competitors." [8] In effect, then, the majority posits dual cartels, one among the nonintegrated VCM firms and another with the integrated VCM/PVC firms monitoring the PVC sales of one another, reaching overall agreement on VCM prices and output. Because of the adverse effect a collusive agreement would be likely to have on the nonintegrated PVC producers, however, the integrated VCM/PVC producers

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[271] *Marathon Oil Corp. v. Mobil Corp.*, 669 F. 2d at 381.

[1] When there is no threat of single firm market power, the controlling question is "whether the challenged acquisition is likely to hurt consumers by making it easier for the firms in the market to collude, expressly or tacitly, and therefore force prices above or further above the competitive level." *Hospital Corporation of America*, 106 FTC 361, 464 (1985), *aff'd* 807 F.2d 1381 (7th Cir. 1986), *cert. denied*, ____ U.S. ____, 107 S.Ct. 1975, (1987).

[2] After the acquisition, these included Goodrich, Formosa, Georgia Pacific, Borden and Conoco.

[3] This group included Dow, Shell, and PPG after the acquisition at issue here.

[4] There were eight principal firms in this category after the acquisition: Air Products, CertainTeed, Keysor-Century, Occidental, Pantasote, Shintech, GenCorp, and Tenneco.

[5] *See* Majority Opinion at 94–96, 103–104.

[6] Majority Opinion at 94.

[7] *See* Majority Opinion at 99.

[8] Majority Opinion at 99. In effect, the collusive effort proposed by the majority would include agreement on open market sales among all VCM producers and a separate collusive agreement among the integrated VCM/PVC producers at the PVC level. For the whole scheme to work this latter agreement would have to consist of agreed upon prices and output levels of PVC that incorporated the cartel's "market" price for VCM.

would have a significant incentive to undercut any collusive efforts.[9]

As the majority recognizes, to remain in the market the nonintegrated PVC firms would have to accept increases in the price of VCM imposed by the cartel. Because VCM is used in a fixed proportion with other inputs to produce PVC, and there is no commercially available substitute for VCM, nonintegrated PVC producers could not shift to another imput. They would be forced to pay any supracompetitive price for VCM.[10] Since the demand for PVC is relatively inelastic, the nonintegrated PVC producers would probably be able to pass along much of the price increase. Unless they were able to pass along all of the price increase, however, their profit margins would necessarily decline, as would their sales volume.[11]

The nonintegrated PVC producers compete, of course, with the integrated VCM/PVC producers. Because the integrated VCM/PVC producers need not charge themselves the same VCM prices that would be forced on the nonintegrated PVC producers, they have the ability to undersell the nonintegrated PVC producers.[12] If the price of VCM rose, integrated VCM/PVC firms would have an incentive to raise PVC prices, but by a smaller amount than the nonintegrated PVC producers would have to charge to take account of the higher cartel price of VCM. In this way, integrated producers could enjoy both increased profits per unit and increased market share.

Integrated producers would face such incentives until the conspiracy failed, with nonintegrated PVC producers, squeezed by higher VCM costs and price competition in the PVC market, reducing VCM purchases and PVC sales or exiting the industry. A decrease in the market share of nonintegrated PVC firms would ultimately reduce the market of the nonintegrated VCM firms. As a result, the nonintegrated VCM firms only have an incentive to increase the price of VCM if they can be assured that the integrated VCM/PVC producers will not undersell the nonintegrated PVC producers. Unless there are strong assurances that this will be the case, nonintegrated VCM firms will not undertake a collusive strategy that results in eroding their own market share.

III. Ability of Nonintegrated VCM Firms To Monitor Integrated Firms

In order for a collusive strategy to succeed, VCM producers would not only have to develop a consensus on price and output levels,[13] they must also be able to enforce that tacit agreement. The necessary prerequisite for any retaliatory conduct is the ability to monitor the conduct of competitors and detect cheating on the cartel. The task of monitoring a collusive arrangement in the VCM market would be extremely difficult, and would fail for many of the same reasons the majority concludes that collusion in the PVC market is unlikely in this case.[14] In order to be successful, a VCM cartel would be required to observe the actions of the integrated VCM/PVC producers at three stages of the production process: First, open market sales of VCM; second, sales of PVC; and third, sales of products fabricated from PVC by those firms integrated further downstream into that stage.

Perhaps the easiest task of monitoring involves open market sales of VCM. If a consensus price could be established, nonintegrated VCM firms would be able to detect cheating by integrated firms selling to nonintegrated PVC producers at less than the cartel price. The opposite is also true, however. Integrated firms would be able to determine the market price being charged to nonintegrated PVC producers. To the extent that integrated firms can obtain some of these sales, they can obtain the benefits of the supracompetitive pricing being charged to the nonintegrated PVC producers. Similarly, knowing the market price for VCM, they are in a better position to undercut the price that the nonintegrated PVC firms ultimately charge.

As the majority recognizes, the nonintegrated firms are at a relative disadvantage in monitoring the integrated VCM/PVC producers. Because most of the VCM produced by the integrated firms is not sold on the market but consumed internally,[15] the only recourse of the nonintegrated VCM producers it to attempt to determine whether the integrated VCM/PVC firms are including the consensus VCM price in their PVC prices and producing the appropriate amount of PVC.

This task is likely to be quite difficult for the nonintegrated VCM producers to accomplish. First, there are a large number of purchasers of PVC resin that must be monitored.[16] Moreover, many PVC costs and outputs must be monitored. There are different grades of PVC and different quality levels within grades. In addition, individual plant operating costs and transportation costs vary. Thus the opportunities for the integrated firms to cheat are very great.[17]

The majority suggests that the nonintegrated VCM producers can use

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[9] Another point where the incentives of the VCM producers vary is in the situation where VCM producers are integrated further upstream into production of chlorine (and caustic soda). Other VCM firms have long term contracts to purchase chlorine at a fixed price.

VCM is produced from ethylene, a petroleum product, and chlorine. Chlorine is itself produced by applying an electrical current to brine, yielding 1.1 pound of caustic soda for every pound of chlorine. When there is a large demand and high price for caustic soda, as there was in 1980, excess chlorine is produced. As a result, chlorine costs for this group of integrated firms (e.g. PPG and Dow) will vary with the demand for caustic soda. *See, e.g.*, RX 57230 (Diamond Shamrock's cost for chlorine estimated to be a negative .1 cents per pound). Chlorine cannot be easily stored, and when excess chlorine is produced there is a strong incentive to use it in VCM production.

VCM production costs may therefore differ significantly between firms that purchase chlorine at prices set in long term contracts and integrated firms subject to fluctuations in chlorine production and chlorine prices. This factor increases the difficulty of colluding on VCM prices and output.

[10] Of course cartels in both the VCM and PVC markets are extremely unlikely to arise, because an entity controlling one stage of a multi-stage production process will earn the largest profit when the other stages perform competitively. *See, e.g.*, R. Posner and F. Easterbrook, *Antitrust Cases, Economic Notes and Other Materials* 803–07, 875–86 (2d ed. 1981).

[11] In the hypothetical case in which the demand for PVC was perfectly inelastic, PVC producers could pass on all of the price increase and would not experience a decline in their sales volume. The majority does not suggest that this hypothetical case exists in the real world.

[12] The integrated VCM/PVC firms also enjoy an advantage over a VCM cartel because they can vary in prices of the different grades of PVC that they sell. The nonintegrated VCM firms, by contrast, must sell all of their VCM at the supracompetitive price, and the nonintegrated PVC firms will have to pay for, and pass along, an increased price for all grades of PVC that they produce.

[13] The majority suggests that the integrated VCM/PVC producers would "passively welcome collusion in the [VCM] market—in the sense that they will profit from declining to increase VCM production in response to higher VCM prices . . . ." Majority Opinion at 96. They might profit even more by increasing their output, a step they are quite likely to take if that output cannot be readily observed.

[14] This presumes that a collusive strategy would be successful in raising prices in the first place. As the majority points out, pp. 85–89, the sales arrangements among the firms in the VCM and PVC market make them very sensitive to price fluctuations. If a group of firms attempted to create a cartel price for VCM, these efforts would be detected very quickly. Even if successful, however, the integrated VCM/PVC firms would still have an incentive to undercut the cartel price in their PVC sales.

[15] The use of pipelines contributes to the difficulty of determining directly the amount of VCM produced by the integrated VCM/PVC firms.

[16] A 1979 Goodrich study indicated that 300 PVC resin buyers accounted for 80% of the market. CX 53J–K.

[17] Even if the integrated firms can determine that other integrated firms are cheating (which may be quite difficult), it is still to their advantage to do so if the nonintegrated firms do not also learn this fact.

the nonintegrated PVC producers to assist in their efforts to monitor the PVC sales of the integrated VCM/PVC firms. However, if the nonintegrated PVC producers learn that they are being undersold, they would be likely to report that fact to the nonintegrated VCM producers. The nonintegrated PVC producers' only alternative to losing market share would be to demand lower prices from the VCM producers, which, if successful, would itself defeat the cartel.[18]

The final stage at which monitoring would be necessary in order to detect cheating on the cartel is in fabrication of products from PVC resins. Four of the five integrated VCM/PVC producers are vertically integrated further downstream into fabrication of products from PVFC.[19] As long as these integrated firms have the capability of substantially increasing their output of PVC fabricated products, successful implicit collusion in the VCM market would have to include agreement on the optimal amount of PVC to be produced, as well as the output and pricing of PVC fabricated products and concomitant monitoring. Unless the nonintegrated VCM producers are able to monitor price cutting by integrated firms at that stage, there is a significant opportunity for the integrated VCM/PVC firms to expand production of those end products and increase market share at the expense of the nonintegrated PVC producers. This is likely to be very difficult to monitor.

As a result, tacit collusion among all VCM producers would fail unless it is possible to monitor not only all open market sales of VCM to nonintegrated PVC producers, but also the PVC output of the integrated VCM/PVC producers, as well as their production of materials fabricated from PVC. The same factors that lead the majority to conclude that collusion is not a threat at the PVC level lead me to conclude that collusion at the VCM level is also not feasible.

[18] The nonintegrated PVC producers have an incentive to seek lower prices in order to maintain or increase their competitive position in any event, and might well claim that they are being undersold even if they are not.

[19] Goodrich estimated that Borden utilized 39% of its PVC capacity internally. RX 200D. Borden's internal use of PVC consisted primarily of the production of PVC film for meat and produce packaging and pallet stretch wrap. Approximately 29% of Borden's 1982 PVC capacity was devoted to this use. The remaining 10% of captive PVC production was utilized in the production of coated fabrics. RX 200E.

Goodrich's own captive PVC production was used to make pipe, windows, packaging, siding, wire and cable. In 1981 Goodrich had 46.6% of the siding market, 15.6% of the pipe market, 16.5% of the window market, 3.4% of the packaging market, and 30.0% of the wire and cable market.

Formosa's captive production of PVC is used to make pipe, film, and sheet. RX 247A.

IV. Conclusion

Unlike the majority, I believe that the vertical integration present in the VCM and PVC markets makes collusion on VCM extremely difficult, if not impossible. Not only do the integrated VCM/PVC producers have strong incentives to jointly undercut any cartel price for VCM, the process of detecting any cheating would be so complicated that it would not be likely to succeed. I would affirm the ALJ and dismiss the complaint.

Issued: March 15, 1988.

Separate Statement of Commissioner Azcuenaga, With Whom Commissioner Bailey Joins, Concurring in Part and Dissenting in Part

I concur in the opinion of the majority insofar as it finds that the acquisition by B.F. Goodrich of Diamond Shamrock Plastics Corporation from Diamond Shamrock Chemicals Company may substantially lessen competition in the market for vinyl chloride monomer ("VCM") in violation of section 7 of the Clayton Act. Unlike the majority, I would also find liability in the market for polyvinyl chloride ("PVC"). I disagree with the presumptions based on concentration data that the majority employs and with their analysis of competitive conditions in the market for PVC.

As the majority recognizes, the level of and increase in concentration resulting from this acquisition in both the VCM and PVC markets create a rebuttable presumption of anticompetitive effects. The Department of Justice 1984 Merger Guidelines divide the range of concentration as measured by the Herfindahl-Hirschman Index ("HHI") into three tiers: Unconcentrated, moderately concentrated and highly concentrated. Goodrich's acquisition increased the HHI by 221 points to 1131 [1] in the PVC market and by 304 points to 1663 in the VCM market.[2] Both markets fall within the moderately concentrated range (post-acquisition HHI between 1000 and 1800), in which the Department has said it is more likely than not to challenge acquisitions that increase the HHI by 100 points or more. When an acquisition falls in this middle range, the Guidelines anticipate a careful review of competitive conditions, and the Commission has said that an "especially careful review of a number of industry characteristics in addition to concentration" is needed to assess the likely competitive effects of the transaction. *Weyerhaeuser Co.*, 106 F.T.C. 172, 280 (1985).[3]

Having established that the concentration in each market falls within the middle tier, the majority then subdivides that tier and assigns to each segment a different presumption of liability before proceeding to an analysis of other competitive conditions. Although both markets are moderately concentrated, the majority concludes that because the PVC market is moderately concentrated "only by the barest of margins," the presumption of anticompetitive effects in that market is "even weaker." Slip op. at 57–58. The slightly higher numbers in the VCM market create a "relatively strong presumption of anticompetitive effects," according to the majority, which can be rebutted only by "relatively strong evidence from other factors." Slip op. at 63. This emphasis by the majority on relatively minor differences in concentration statistics suggests that the numbers have a scientific predictive value that does not exist.

The Commission often has qualified the significance of concentration data as a predictor of market power, *e.g.*, FTC Statement Concerning Horizontal Mergers, 2 Trade Reg. Rep. (CCH) ¶ 4516, at 6901–3 (June 14, 1982) ("FTC Statement"), and the Merger Guidelines also make clear that "the numerical divisions suggest greater precision than is possible with the available economic tools and information." Section 3.1. We use market share data in a section 7 case "as an important preliminary surrogate measure of market power," FTC Statement at 6901–3, but statistics "provide only the starting point for analyzing the competitive impact of a merger." Merger Guidelines § 3.11. Because of the limited predictive power of market share and concentration data, a careful evaluation of other indicators of market power usually is necessary.

[1] I.D.F. 53 *in camera*; slip op. at 54 (based on actual production). These figures correctly attribute all of Diamond Shamrock's Deer Park PVC plants to Goodrich, because the sale of Deer Park #5 to Goodrich precluded the sale of the other Deer Park plants to another firm and Diamond agreed, until the plants were closed, to operate them for Goodrich. I.D.F. 10–14; slip op. at 7–10 & n. 12. Goodrich perceived the arrangement as "the only option that keeps Diamond from being a disruptive force in the market place." *Id.* at 10.

[2] I.D.F. 262; slip op. at 61 (based on actual production).

[3] In *Weyerhaeuser*, the challenged acquisition increased the HHI by 211 points to 1166, "within the lower end of the mid-range of the Department of Justice Merger Guidelines." 106 F.T.C. at 280.

Although the Commission has said that "more persuasive" evidence will be needed to rebut a *prima facie* case when a market is highly concentrated than when the market is moderately concentrated, *Grand Union Co.*, 102 F.T.C. 812, 1055 (1983) (dicta),[4] I know of no authority to support the majority's differing presumptions when concentration data in two separate markets, both of which are moderately concentrated, are similar to the two before us. The Merger Guidelines do not establish a different standard of review for mergers with different market share data, except to suggest, as the Commission did in *Grand Union*, that the presumption of anticompetitive effects based on statistics will be difficult to rebut when the market is highly concentrated.[5]

The majority's presumptions add nothing to merger analysis in terms of predictability or ease of application. The majority infers that in the *Weyerhaeuser* case, the Commission decided that the concentration data created only a weak presumption of anticompetitive effects, and the majority suggests that non-statistical evidence to rebut the presumption of illegality in the PVC market "need not be as strong as it was in *Weyerhaeuser*." Slip op. at 58. In *Weyerhaeuser*, the Commission dismissed the complaint based on an evaluation of several market characteristics including, in particular, ease of entry. I see no easy or useful way to compare the weight of evidence in *Weyerhaeuser* concerning industry characteristics such as ease of entry in the west coast market for corrugating medium (a paper product) with the weight of the non-statistical evidence concerning the PVC market, in which the majority finds substantial barriers and impediments to entry. Slip op. at 31. Simply to attempt such a comparison between highly fact-specific cases would complicate merger analysis even further without any apparent off-setting benefits.

The terms used by the majority may well raise more questions than they put to rest. Is the presumption of liability in the market for VCM "relatively strong" only as compared to the "even weaker" presumption in the PVC market? In the context of the Herfindahl-Hirschman Index, does "relatively strong" mean "slightly weak," "somewhat strong," "quite strong" or plain old everyday "average?" How does the "relatively strong" presumption for VCM compare to the presumption that applies when the HHI rises 100 points and exceeds 1800? It might be possible to work through this exercise, but further attempts to refine the presumptions stemming from concentration figures are unlikely to be useful until those figures can be shown to correspond more precisely to market power. The temptation to seek comfort from the apparent certainty of numbers is understandable, but we should be wary of false comforts.

In addition to finding that the PVC and VCM markets are moderately concentrated, the majority finds "substantial barriers and impediments to entry" in both markets and finds that "fringe firms are unlikely to constrain collusive conduct" in either market. Slip op. at 31. The only significant difference between the two markets for the purpose of merger analysis is the number of customers. PVC purchasers number in the hundreds, I.D.F. 216; the only purchasers of 96% of VCM consumed in the United States are the small number of firms that produce PVC. I.D.F. 289. These facts suggest that collusion would be easier in the PVC market than in the VCM market, if, as the majority correctly assumes, slip op. at 84–85, collusion is easier for sellers in markets with a large number of buyers.

The majority nevertheless identifies three reasons (in addition to lower concentration) for concluding that there is no violation in the market for PVC. First, PVC is said to be "relatively heterogeneous." Second, the majority finds that costs "vary significantly" among PVC producers. Finally, although the price elasticity of PVC is "relatively low," the majority concludes that the ability of PVC producers to raise prices "may be constrained to some degree by the higher price elasticity of demand" for PVC end products. Slip op. at 113. None of these conclusions is supported by the record. In fact, PVC is a homogeneous product, the costs of producing PVC do not vary significantly among firms and the elasticity of demand for PVC is low and unlikely to constrain collusion.

We are charged with responsibility for making predictive judgments under section 7 on the basis of all the relevant facts.[6] The fact-specific analysis of the two markets at issue here discloses no material differences between them and shows that anticompetitive effects are likely in each. Indeed, unless one accepts the majority's differing presumptions based on market share and concentration data, the case for liability in the PVC market is at least as strong as the case for liability in the VCM market.[7]

1. Homogeneity of PVC

The majority concludes that PVC is "considerably more heterogeneous" (compared, presumably, to VCM), because it is produced in three grades and because producers face differing transportation costs. Slip op. at 65–66. This heterogeneity, according to the majority, is one of the reasons collusion is unlikely in the PVC market. I disagree. On this record, the PVC market is not one in which product differentiation is important.

In terms of its physical characteristics, PVC is boringly homogeneous. PVC is classified in three general, differently priced categories—pipe, general purpose and specialty PVC. Pipe grade PVC historically has been the lowest priced of the three grades. General purpose PVC sells at a small premium over pipe resin, and specialty resin usually commands a small premium over general purpose PVC.[8] More than 75% of bulk and suspension PVC is considered by industry members to be a "commodity" product, with no significant quality differences among producers. I.D.F. 87 & 90. Although there may be some quality differences among specialty resins produced by different firms, industry witnesses testified that any producer could deliver an acceptable substitute specialty resin.[9]

Industry witnesses also testified that buyers of commodity grade PVC will switch suppliers over small differences in price, I.D.F. 87 & 90; R.A.B. at 36, and that no specialty resin supplier can command a price higher than that of competing suppliers of the same grade. I.D.F. 88. The willingness to switch

[4] In *Grand Union Co.*, the Commission found no Section 7 violation "for reasons other than the level of concentration and . . . market share." 102 F.T.C. at 1056.

[5] Merger Guidelines § 3.11(c). The Commission has said that the value of non-market share evidence will be high when it consistently points in the same direction, particularly when the market shares are in the low and moderate ranges, and that non-market share factors may be given less weight when concentration is high. FTC Statement at 6901–4.

[6] "(C)onsiderations [other than concentration statistics] often do not lend themselves to precise mathematical expression, but they can be more important than quantitative measures of concentration." Echlin Manufacturing Co., 105 F.T.C. 410, 483–84 (1985).

[7] If this were an exercise in prosecutorial discretion, the practical effect of the majority's decision in the PVC market would be to raise the dividing line identified in the Merger Guidelines between unconcentrated and moderately concentrated markets.

[8] H. Wheeler 1750–51; DiLiddo 3268; Schaefer 1076; R.A.B. at 36.

[9] Schaefer 1076; Becker 1331–33.

suppliers over small price differences and the inability of any supplier to obtain a price premium tend to confirm that PVC is homogeneous within grades.[10] Buyers would be unwilling to switch suppliers to gain small price advantages if there were other important differences in the PVC produced by different firms, and firms could command price premiums if they offered a unique product.[11] The record shows that the physical qualities of PVC place it as the homogeneous end of the product spectrum and do not impair the ability of PVC firms to collude.[12]

The majority also treats the cost of transporting PVC as an aspect of heterogeneity and concludes that transportation cost differences among PVC firms are likely to complicate collusion. Slip op. at 68 & 80. To support its conclusion, the majority simply recites the fact that PVC plants are situated in various locations around the country. Slip op. at 68–69.[13] This information, however, tells us nothing, because the record does not show the locations of the PVC customers served by the PVC plants. In fact, the record is largely silent as to the cost of shipping PVC to customers. In more than 5000 pages of testimony, one witness testified that "freight and other things" could provide "small differences in pricing,"[14] and the respondents' economic expert asserted, without citing any supporting material, that locational differences were "likely to affect" the cost of serving customers.[15]

Even if the cost of shipping PVC to customers differs among firms, any differences are unlikely to be sufficient to diminish the likelihood of collusion in the industry. If transportation cost differences were significant, we would expect to see a series of regional markets. Instead, the record shows that the market is national,[16] that PVC producers sell in the national market on the basis of delivered price and that price differences among suppliers are as small as one-quarter to one-half cent per pound. These facts suggest that transportation costs do not cause substantial cost differences among firms that would complicate collusion.

2. Costs of Producing PVC

The majority concludes that the costs of producing PVC vary significantly among firms, making collusion more complicated and, therefore, less likely. The differing costs identified by the majority are the costs of operating reactors of different sizes and the costs of transporting PVC to customers. Slip op. at 77–78. As discussed in the section above, differences in the cost of transporting PVC, which are also treated by the majority as an aspect of heterogeneity, are insignificant. Although operating costs may vary among firms, the record also does not support the majority's conclusion that the differences are significant.

PVC reactors of different sizes have different production costs, but, as the majority recognizes, production costs do not vary within grade but "from one PVC resin grade to another." Slip op. at 79. Commodity PVC, which accounts for about 75% of industry sales, is produced in large reactors. Industry witnesses testified that the costs of producing PVC in large reactors are similar among firms. *See* slip op. at 78–79. Smaller reactors operate at a cost disadvantage when compared to large reactors, but smaller reactors produce specialty PVC resins, which occupy a special niche in the market and enjoy a price premium over commodity PVC resins. Indeed, one of Diamond Shamrock's goals in the PVC market was to occupy the higher priced specialty market niches,[17] and Diamond Shamrock's position in the specialty resin market was an attribute that made the acquisition attractive to B.F. Goodrich.[18] The cost differences related to different size reactors are likely to be significant, but those cost differences are unlikely to frustrate collusion when firms face similar costs for the same grades of PVC.

To show that PVC firms face significantly different operating costs, the majority cites RX 1168A–B, *in camera*. This exhibit is based on a "cost study" prepared by a Goodrich employee, who estimated the costs of other firms but did not have access to actual cost data from any firm except Goodrich itself.[19] Not surprisingly, the study shows a range of operating costs for PVC plants that is virtually identical to the range of actual costs at Goodrich's PVC plants. The range of costs shown for competing firms (and cited by the majority) is 14.30 cents per pound to 21.94 cents per pound. The same document shows that Goodrich's operating costs for its PVC plants ranged from 14.30 cents to 21.53 cents per pound.[20] This document at best supports a conclusion that there may be substantial intra-firm cost variations, but it tells us nothing about cost differences among firms or their impact on competition.[21]

The record shows that PVC producers consistently agree to meet the lower prices of their competitors, which a firm presumably would not do if it suffered a persistent and significant cost disadvantage. On this record, I conclude that although the costs of producing PVC may differ among firms, the differences are not significant and are not likely to make collusion difficult.[22] As the majority observes in discussing the costs of producing VCM, "[a]lthough respondents have identified some minor differences [among firms], absolute congruence is not needed to heighten the likelihood of" collusion. Slip op. at 83.

3. Price Elasticity of Demand for PVC

The majority also concludes that "although the price elasticity of demand for PVC is * * * relatively low," attempts to collude on the price of PVC may be constrained by the elasticity of demand for end products manufactured

[10] DiLiddo 3372; Disch 707–09; Schaefer 1200–02; McMath 1951. These witnesses testified that PVC buyers will change suppliers for price differences as low as one-quarter and one-half cent per pound.

[11] The respondents' economic expert testified that the physical heterogeneity of PVC was "not severe," as evidenced by the lack of systematic price discrimination. Klass 5363.

[12] *See* United States v. Container Corp., 393 U.S. 333, 336 (1969) ("While containers vary as to dimensions, weight, color, and so on, they are substantially identical, no matter who produces them, when made to particular specifications."); FTC v. Bass Brothers Enterprises, Inc., 1984–1 Trade Cas. (CCH) ¶ 66,041, at 68,612 (N.D. Ohio 1984) ("Carbon black is a homogeneous, fungible product. Although it is produced in numerous different grades . . . in fact nearly all of the producers produce basically the same grades and types.").

[13] The majority also cites RX 1168, slip op. at 69 n.152, but this document is based on RX 245 and does not show the actual costs of firms. *See* notes 19 & 21 *infra* & accompanying text.

[14] H. Wheeler 1749; *see also* Weber 1800.

[15] Klass 4311.

[16] The parties stipulated that the appropriate market is national, and the majority found that a national market "is consistent with the record evidence." Slip op. at 15.

[17] Becker 1327–28; Weber 1794–96; Arp 3519.

[18] DiLiddo 3205–06, 3209, 3211–13 *in camera*; *see* slip op. at 8–10.

[19] RX 245 *in camera*, which contains neither calculations nor method of calculation, was based on unspecified information from "public sources" and an employee's "best estimates" from those sources. DiLiddo 3225. RX 1168A–B, cited by the majority to show different PVC production costs, slip op. at 80 n.179, is based on and has the same deficiencies as RX 245.

[20] This difference of 7.64 cents apparently reflects the difference between operating large reactors in which commodity resins are produced and operating smaller reactors in which specialty resins are produced. *See* slip op. at 79 n.177.

[21] Even the respondents' economic expert testified that the numbers provided on RX 245 *in camera* should not be viewed as "hard numbers." Klass 5323.

[22] Nor do differing degrees of vertical integration suggest different production costs. In discussing PVC production costs, the respondents' economic expert said that if costs for integrated firms were clearly lower, then nonintegrated firms would not be able to survive. He concluded that the data in the record "clearly indicate that there is not such a uniform advantage." Klass 5337–38.

from PVC. Slip op. at 113.[23] The record, however, shows not only that the elasticity of demand for PVC is low, but also that the price of PVC could be raised above competitive levels without causing the purchasers of end products to switch to other products. Industry witnesses testified that changes in PVC prices do not affect the demand for products made from PVC.[24] For example, a 1983 B.F. Goodrich study, quoted by the majority, slip op. at 74–75, stated:

> PVC pipe manufacturers appear to have plenty of room for price increases before approaching the price levels of most competing materials. (Even if the prices were identical, PVC would still have the added advantage of lower installed cost.)

CX 247A, *in camera*.

At some point, it is no doubt true that an increase in the price of PVC would cause some consumers to substitute cheaper products for products made from PVC, but the record suggests there is ample room before that point is reached for a successful agreement to raise prices above competitive levels.

4. Vertical Integration

The respondents maintain that the different degrees of vertical integration among PVC firms and among VCM firms would make collusion more difficult in either market.[25] Aspects of vertical integration, like other aspects of market structure, may indeed affect the ease of reaching or enforcing a collusive agreement. *See* R. Posner, *Antitrust Law* 60 (1976); F. Scherer, *Industrial Market Structure and Economic Performance* 204–05 (2d ed. 1980). The respondents, however, have not gone appreciably beyond general assertions of theory to show why in this case, where other relevant facts consistently point to the ease of collusion in both the PVC and VCM markets, vertical integration nevertheless makes collusion unlikely.

I find confusing the majority's lengthy response to the respondents' vertical integration argument, which gives the argument more credit than is due.[26] I do agree, however, with the majority's conclusion that both integrated and nonintegrated producers of VCM have strong incentives to collude and could readily detect cheating from a collusive agreement. If, as the majority concludes, PVC firms could accept and pass on to their customers a collusive VCM price increase, slip op. at 111, it must also be true that they could pass on a collusive PVC price increase.[27] The majority opinion therefore suggests, and I agree, that vertical integration does not deter the ability of PVC firms to collude.

An analysis of the record shows conditions that are conducive to collusion in the PVC market and in the VCM market. Although we can speculate on the extent to which the interests of integrated and nonintegrated firms might complicate collusion, the record shows nothing about differing incentives or other differences stemming from vertical integration that suggests that collusion would be unlikely in either market.

With respect to the market for PVC, I dissent.

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[23] This conclusion is inconsistent with the majority's statements that "the price elasticity of demand for most PVC end products is relatively low," slip op. at 75, and that "the demand for PVC is sufficiently inelastic to make it likely that an increase in VCM prices can profitably be passed along to PVC customers." Slip op. at 111. If PVC producers can pass on a cost increase (such as a VCM price increase), then presumably they could also profitably pass on a collusive PVC price increase.

[24] Schaefer 1141; Disch 664–80; Becker 1325–36; H. Wheeler 1753–54; Weber 1811–12, 1828. The majority is correct in rejecting the assertion of the respondent's expert witness that PVC is price elastic. Slip op. at 75 n.168.

[25] The respondents argue that differing degrees of vertical integration increase the number of areas with respect to which a consensus would have to be reached, complicate price and output monitoring and contribute to an environment of differing goals, incentives, costs and profit opportunities among firms. R.A.B. at 40 & 69.

[26] We are concerned in this case with horizontal market power, the ability to raise price above competitive levels. Vertical integration does not affect horizontal market power, which can be exercised in either or both of the vertically related markets. *See, e.g.*, R. Bork, "Vertical Integration and the Sherman Act: The Legal History of an Economic Misconception," 22 U. Chi. L. Rev. 157, 195–98 (1954).

[27] *See* R. Bork, *supra* note 26, at 196 n.128; F. Warren-Boulton, *Vertical Control of Markets* 51–55 (1978).

SECURITIES AND EXCHANGE COMMISSION

17 CFR Part 200

[Release Nos. 33–6764; 34–25558; 35–24616; 39–2156; IC–16353; IA–1111; File No. S7–32–87]

Expedited Publication of Interpretative, No-Action and Certain Exemption Letters

AGENCY: Securities and Exchange Commission.

ACTION: Final rule.

SUMMARY: The Commission announces the adoption of amendments to its regulations on Information and Requests to provide for publication of interpretative, no-action, and certain exemption letters, except for correspondence related to certain trading practices rules, as soon as practicable after such letters are sent or given to requesting parties unless temporary confidential treatment is granted.

EFFECTIVE DATE: May 16, 1988.

FOR FURTHER INFORMATION CONTACT: Michael Hyatte, (202) 272–2573, Office of Chief Counsel, Division of Corporation Finance, Securities and Exchange Commission, 450 Fifth Street, NW., Washington, DC 20549.

SUPPLEMENTARY INFORMATION: The Commission is adopting revisions to rule 81 under its regulations on Information and Requests.[1]

I. Executive Summary

On September 8, 1987, the Commission proposed for public comment amendments to rule 81 to provide for expedited publication of interpretative, no-action and certain exemption letters.[2] The proposal called for immediate publication of such letters except in cases where confidential treatment had been granted or when the request related to trading practices rules[3] under the Securities Exchange Act of 1934 (Exchange Act).[4] After consideration of comments received from the public, [5] the Commission has determined to adopt the final rule as proposed.

Two commentators suggested to the Commission that the rule should make no exception for trading practices correspondence.[6] In response to these comments, the Commission is today issuing a companion release[7] proposing a further amendment to the rule that would provide for prompt publication of trading practices correspondence and thus treat all correspondence subject to rule 81 under uniform procedures.

[1] 17 CFR 200.81.

[2] Release No. 33–6740 (September 8, 1987) [52 FR 35115].

[3] 17 CFR 240.10b–6, 240.10b–7, 240.10b–8, 240.10b–13, and 240.13e–4. The amendments continue the practice of withholding publication of such requests and the staff's responses for 30 days. All these rules permit the Commission to grant exemptions from their terms without notice and opportunity for hearing.

[4] 15 U.S.C. 78a *et seq.*

[5] Five comment letters were received by the Commission. The letters of comment are available for public inspection at the Commission's Public Reference Room in File No. S7–32–87.

[6] Comment letter from Andrew M. Klein, *et al.*, American Bar Association, Section of Corporation, Business and Banking Law, January 4, 1988; comment letter from Joseph D. Hansen, New York State Bar Association, Banking, Corporation and Business Law Section, November 6, 1987.

[7] Release No. 33–6765 (Companion Release).

II. Discussion of Amendments

Since January 1, 1970, the effective date of rule 81, interpretative and no-action correspondence, reflecting the informal advice of the Commission's staff, has been made available to the public 30 days after the date of the staff's response, except in cases where confidential treatment for up to an additional 90 days has been granted. Recognizing the extent of public interest in this correspondence and the value of more timely publication of the staff's views, the Commission proposed in Release No. 33-6740 to make interpretative, no-action, and certain exemption [8] letters generally available as soon as practicable after the staff's response is sent or given to the requesting party, unless confidential treatment has been afforded. Because of concerns that correspondence under the trading practices rules might more typically involve matters sensitive to premature public disclosure, the Commission proposed that such correspondence would continue to receive delayed publication. The rule as adopted contains such an exception. However, as indicated in the Companion Release, the Commission is reconsidering the exception for trading practices correspondence.

Four of the five comment letters received expressed or implied general support for amendment of the rule to expedite publication of interpretative, no-action, and exemption correspondence.[9] A majority of the commentators shared the Commission's view that the public benefits of prompt publication under rule 81 are significant. As indicated in the proposing release, members of the public interested in federal securities laws rely substantially on this correspondence and in many instances the staff's no-action positions and interpretative views are the most comprehensive secondary source on the application of these laws.[10] Prompt publication as a general rule also avoids the undesirable impression of giving a "requesting party secret guidance from the Government on how to conduct its affairs," [11] where delayed publication may work to the prejudice of other members of the public without prompt access to the staff's views. The comments supporting more timely publication were not unanimous on the question of automatic exceptions to prompt publication for the trading practices rules, a subject discussed in detail in the Companion Release.

For cases where prompt publication of correspondence would adversely affect the business plans of a requesting party, temporary confidential treatment remains available under rule 81(b).[12] The amended rule does not change the procedures, standards or maximum duration of such treatment. No commentator suggested any inadequacy in the terms of rule 81(b). With temporary confidential treatment available under rule 81(b), premature disclosure of business plans may be prevented in an appropriate case, if the party so requests and the Commission's staff concurs.[13] At the same time, the public interest served by the availability of the staff's positions will be met in ordinary cases in which no substantial prejudice to legitimate business purposes arises through public disclosure. This rule's new general standard for prompt disclosure of this correspondence will ease administration of the rule by the Commission's staff, and, because public availability dates will normally be identical to the date of the staff's response, research and citation of this correspondence should be simplified.[14]

III. Cost/Benefit Analysis

The amendments neither impose additional reporting or record-keeping requirements nor significantly increase regulatory compliance costs. The principal benefit associated with the amendments is that they will allow more timely public inspection of requests for interpretative and no-action advice and certain exemption letters and the staff's responses. Expedited publication will assist the public's understanding of significant questions under the federal securities laws.

IV. Statutory Basis

The amended rule is being adopted under section 19 of the Securities Act of 1933; section 23 of the Securities Exchange Act of 1934; section 20 of the Public Utility Holding Company Act of 1935; section 319 of the Trust Indenture Act of 1939; section 38 of the Investment Company Act of 1940; section 211 of the Investment Advisers Act of 1940; and section 1 of the Freedom of Information Act.

List of Subjects in 17 CFR Part 200

Administrative practice and procedure, Freedom of Information Privacy, Securities.

V. Text of Amendment

In accordance with the foregoing, Title 17, Chapter II of the Code of Federal Regulations is amended as follows:

PART 200—ORGANIZATION; CONDUCT AND ETHICS; AND INFORMATION AND REQUESTS

Subpart D—Information and Requests

1. The authority citation for Part 200, Subpart D, continues to read as follows:

Authority: 80 Stat. 383, as amended, 31 Stat. 54, secs. 19, 23, 48, Stat. 85, 901, as amended, sec. 20, 49 Stat. 833, sec. 319, 53 Stat. 1173, secs. 38, 211, 54 Stat. 841, 855; 5 U.S.C. 552, 15 U.S.C. 77s, 78w, 79t, 77sss, 80a-37, 80b-11, unless otherwise noted.

2. 17 CFR 200.81 is amended by revising the section heading and paragraph (a); by removing the words "90 days after the expiration of such 30 days" and replacing them with the words "120 days from the date the response has been sent or given to such

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[8] The rule as amended codifies the staff's practice of applying rule 81 procedures to exemption letters issued in situations where notice and opportunity for hearing are not required. *See* Release No. 33-6740, 52 FR at 35116.

[9] The Investment Company Institute (ICI) opposed amendment of the rule for administrative reasons. Comment letter from Mary K. Bellamy, Investment Company Institute, October 27, 1987. The reasons cited by the ICI for its opposition include concerns regarding inadvertent, premature release by the Commission staff of correspondence for which confidential treatment was granted and the possibility that under the proposed procedures notice to competitors of the staff's position might be given before the requesting party's actual receipt of the staff's response. These concerns can be addressed through internal staff procedures designed to eliminate inadvertent, premature disclosure of correspondence for which confidential treatment is granted and by the current staff practice of permitting the requesting party to obtain the staff's letter by messenger.

[10] 52 FR at 35115.

[11] Comment letter from Thomas R. Donovan, Chicago Board of Trade, October 6, 1987.

[12] The temporary confidential treatment afforded by rule 81(b), both in its present and amended forms, is not absolute. In the event of a request under the Freedom of Information Act, 5 U.S.C. 552 *et seq.* (FOIA), correspondence with the staff, the staff's response or both would be disclosable to the FOIA requestor at any time prior to publication, except where there is an applicable exemption under the standards of section 552(b) of FOIA.

[13] If the staff intends to deny confidential treatment, the procedure described in rule 81(b) is followed. In such cases, the staff will inform the requesting party of its intent to deny confidential treatment, a determination made without reference to the merits of the substantive request, and allow 30 days for the requesting party to withdraw the letter. This procedure is followed because the request for the staff's advice is voluntary and should not involve the risk of compelled disclosure of the requesting party's business plans without its consent.

[14] Persons submitting correspondence subject to rule 81 are reminded of the procedural requirements set forth in the Note following paragraph (b) of the rule. Matters concerning the appropriate format and number of copies are discussed in Releases No. 33-6253, 45 FR 72844 (October 28, 1980), and 33-6269 (December 23, 1980), both regarding procedures employed by the Divisions of Corporation Finance and Market Regulation. The parallel procedures of the Division of Investment Management are described in Release No. IC-6330, 36 FR 2600 (January 25, 1971).

person" in the first sentence of paragraph (b); by revising the first sentence of the Note to paragraph (b); and adding a sentence to the end of paragraph (c); as follows:

§ 200.81 Publication of interpretative, no-action and certain exemption letters and other written communications.

(a) Except as provided in paragraphs (b) and (c) of this section, every letter or other written communication requesting the staff of the Commission to provide interpretative legal advice with respect to any statute administered by the Commission or any rule or regulation adopted thereunder, or requesting a statement that, on the basis of the facts stated in such letter or other communication, the staff would not recommend that the Commission take any enforcement action, or requesting an exemption, on the basis of the facts stated in such letter, from the provisions of the Securities Exchange Act of 1934 (15 U.S.C. 78a *et seq.*) or any rule or regulation thereunder, where the issuance of an order granting such exemption does not require public notice and an opportunity for hearing, together with any written response thereto, shall be made available for inspection and copying by any person. Letters or other written communications with respect to rules 10b–6, 10b–7, 10b–8, 10b–13 and 13e–4 [§§ 240.10b–6, 240.10b–7, 240.10b–8, 240.10b–13 and 240.13e–4 of this chapter] under the Exchange Act, together with any response thereto, shall be made available for inspection and copying by any person 30 days after the response has been sent or given to the person requesting it. All other letters or written communications, together with the response thereto, shall be made available for inspection and copying by any person as soon as practicable after the response has been sent or given to the person requesting it.

(b) * * *

Note.—All letters or other written communications requesting interpretative advice, a no-action position, or an exemption shall indicate prominently, in a separate caption at the beginning of the request, each section of the Act and each rule to which the request relates. * * *

(c) * * * Further, this section shall not apply to applications or other written communications filed pursuant to § 240.24b–2 that relate to objections to public disclosure of information filed with the Commission or any exchange.

By the Commission.

Jonathan G. Katz,

Secretary.

April 7, 1988.

[FR Doc. 88–8241 Filed 4–13–88; 8:45 am]

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 452

[Docket No. 88N–0048]

Antibiotic Drugs; Ertythromycin Topical Gel

AGENCY: Food and Drug Administration.

ACTION: Final rule.

SUMMARY: The Food and Drug Administration (FDA) is amending the antibiotic drug regulations to provide for the inclusion of accepted standards for a new dosage form of erythromycin, erythromycin topical gel. The manufacturer has supplied sufficent data and information to establish its safety and efficacy.

DATES: Effective April 14, 1988; comments, notice of participation, and request for hearing by May 16, 1988; data, information, and analyses to justify a hearing by June 13, 1988.

ADDRESS: Written comments to the Dockets Management Branch (HFA–305), Food and Drug Administration, Rm. 4–62, 5600 Fishers Lane, Rockville, MD 20857.

FOR FURTHER INFORMATION CONTACT: Peter A. Dionne, Center for Drug Evaluation and Research (HFN–815), Food and Drug Administration, 5600 Fishers Lane, Rockville, MD 20857, 301–443–4290.

SUPPLEMENTARY INFORMATION: FDA has evaluated data submitted in accordance with regulations promulgated under section 507 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 357), as amended, with respect to a request for approval of a new dosage form of erythromycin, erythromycin topical gel. The agency has concluded that the data supplied by the manufacturer concerning this antibiotic drug are adequate to establish its safety and efficacy when used as directed in the labeling and that the regulations should be amended in 21 CFR Part 452 by adding a new § 452.510e to provide for the inclusion of accepted standards for the product.

Environmental Impact

The agency has determined under 21 CFR 25.24(c)(6) that this action is of a type that does not individually or cumulatively have a significant effect on the human environment. Therefore, neither an environmental assessment nor an environmental impact statement is required.

Submitting Comments and Filing Objections

This final rule announces standards that FDA has accepted in a request for approval of an antibiotic drug. Because this final rule is not controversial and because when effective it provides notice of accepted standards, notice and comment procedure and delayed effective date are found to be unnecessary and not in the public interest. This final rule, therefore, is effective April 14, 1988. However, interested persons may, on or before May 16, 1988, submit written comments to the Dockets Management Branch (address above). Two copies of any comments are to be submitted, except that individuals may submit one copy. Comments are to be identified with the docket number found in brackets in the hearing of this document. Received comments may be seen in the Dockets Management Branch between 9 a.m. and 4 p.m., Monday through Friday.

Any person who will be adversely affected by this final rule may file objections to it and request a hearing. Reasonable grounds for the hearing must be shown. Any person who decides to seek a hearing must file: (1) On or before May 16, 1988, a written notice of participation and request for hearing, and (2) on or before June 13, 1988, the data, information, and analyses on which the person relies to justify a hearing, as specified in 21 CFR 314.300. A request for a hearing may not rest upon mere allegations or denials, but must set forth specific facts showing that there is a genuine and substantial issue of fact that requires a hearing. If it conclusively appears from the fact of the data, information, and factual analyses in the request for hearing that no genuine and substantial issue of fact precludes the action taken by this order, or if a request for hearing is not made in the required format or with the required analyses, the Commissioner of Food and Drugs will enter summary judgment against the person(s) who request(s) the hearing, making findings and conclusions and denying a hearing. All submissions must be filed in three copies, identified with the docket number appearing in the heading of this